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Executive Summary

The EUB oversees the safe, responsible development of Alberta's energy resources and is committed to building a regulatory framework that inspires public confidence. As part of this mandate, the Field Surveillance Branch inspects over 110 000 operating wells, 16 527 oil batteries and associated satellites, 733 gas plants, and about 317 000 kilometres (km) of pipelines that form the core of Alberta's energy infrastructure. EUB field staff also enforce standards and conditions set out in licences, approvals, and EUB regulations and requirements.

Operating out of eight EUB Field Centres throughout Alberta, 115 field staff inspect construction, operation, and abandonment operations at oil, gas, and oil sands facilities (including pipelines, compressors, and processing plants). They respond to emergencies and public complaints on a 24-hour basis and ensure a consistent approach to enforcement of requirements with noncompliant operators. Recognizing the importance of open communications and community input, the Field Surveillance Branch increased the time spent facilitating the resolution of landowner-industry conflicts and participating in public-industry liaison committees in 2002.

Field Surveillance staff will continue to focus on pipeline corrosion, noncompliant operators, air monitoring activities, facilitation, and improving communication with synergy groups and First Nations and Metis communities throughout the province.

For 2002 and future years, the *Field Surveillance Provincial Summary* will report on activities during the calendar year (January 1 to December 31), instead of the fiscal year (April 1 to March 31). As a result, incidents reported in the last three months of the previous EUB *Provincial Summary Report* have been included in this report, and all comparisons between 2002 and 2001/2002 numbers include a three-month overlap.

Inspections

The EUB kept pace with high activity levels in energy development:

- 13 193 wells were drilled in 2002,[1] in comparison to 14 307 in 2001/2002.
- 8255 initial inspections and 2201 reinspections were completed in calendar year 2002, in comparison to 8407 initial inspections and 2129 reinspections completed in 2001/2002, due to increased personnel allocated to facilitation work, training new staff, and the new field inspection system.

Satisfactory inspections increased significantly, from 64 per cent in 2001/2002 to 70.6 per cent in 2002. Minor unsatisfactory inspections remained constant at 25 per cent, while major and serious unsatisfactory inspections decreased from 4.4 per cent in 2001/2002 to 3.9 per cent in 2002. There was only one serious unsatisfactory inspection in 2002, compared to 11 in 2001/2002.

Enforcement

The EUB is confident that, in general, Alberta's energy industry strives to comply with EUB regulations, requirements, and programs. However, companies that fail to meet

[1] For the purpose of this report, drilling activity includes spuds (new well starts) and re-entries into existing wells; it does not include completions of wells spudded in previous years.

requirements or follow EUB direction are subject to escalating enforcement consequences. Enforcement actions always include deadlines for fixing a problem and may be reinforced by penalties, such as temporary or long-term suspension of operations. In 2002 the number of facilities the EUB ordered suspended decreased to 128 facilities, down from 142 in 2001/2002 and 236 in 2000/2001. However, the cost to industry was greater: $25.8 million in 2002, compared to $16.3 million in 2001/2002 and $12 million in 2000/2001 (see Table 2).

Notable improvements in industry compliance include well servicing operations where, since 1998/1999, the percentage of unsatisfactory inspections has decreased from 12.2 to 6.3. As well, of all the inspections conducted on gas facilities, the percentage that were found to have major unsatisfactory noncompliances decreased from 4.3 in 2001/2002 to 2.3 in 2002.

Well Control Occurrences

Blows and blowouts during drilling and servicing operations are among the most serious incidents for well operations and have the potential to cause public safety and environmental impacts. The EUB regards the number of blows, blowouts, and kicks[2] as a primary indicator of industry's drilling and servicing performance and pays particularly close attention to industry's response to these incidents.

Requirements for high training standards and sophisticated blowout detection and prevention equipment have helped to keep well control occurrences to a minimum. Of the 13 193 wells drilled in 2002, the EUB recorded

- 6 blowouts, 0 blows, and 78 kicks during drilling operations, and
- 5 blowouts and 2 blows during servicing.

All were brought under control with minimal environmental damage and no public safety impacts. The EUB will continue to review all blows and blowouts related to drilling and servicing operations to identify changes to equipment, procedures, and regulations that may be required to reduce drilling and servicing blows and blowouts.

The 78 kicks recorded in 2002 equate to a kick occurrence rate of approximately 6 kicks per 1000 wells drilled. The kick occurrence rate has remained relatively constant for the last five years and is a significant improvement from the years prior to 1997/1998, when the rate averaged 23 kicks per 1000 wells drilled.

Gas Production

The impact gas production facilities have on the public continues to be of concern to the EUB. Fugitive emissions, noise from compressors, black smoke, and flaring are the primary issues affecting the public. In response there were 2170 inspections completed on gas processing facilities in 2002, which is a signification increase compared to 2001/2002, when 1710 inspections were conducted (see Figure 15). In 2002, EUB field staff conducted 105 inspections of well tests to ensure compliance with *Guide 60: Upstream Petroleum Industry Flaring Guide*. This compares to 122 inspections in 2001/2002.

[2] Blows are the unexpected release of wellbore fluids into the atmosphere, while blowouts are the complete loss of control of the flow of fluids from a well. During drilling operations, any unexpected entry of water, gas, oil, or other formation fluid into a wellbore that is under control and can be circulated out is called a kick.

Sulphur recovery efficiencies at gas plants recovering salable sulphur has improved to 98.9 per cent. Overall, sulphur emissions have decreased by 18 per cent since 2000 (from 78 000 to 64 000 tonnes of sulphur emissions).

Pipelines

Alberta has 317 417 km of energy-related pipelines. Of the 516 inspections conducted on pipeline failures/hits in 2002, the EUB recorded

- 46 major unsatisfactory inspections and 0 serious unsatisfactory inspections—all were brought into compliance;
- 34 ruptures, compared to 32 in 2001/2002;
- a failure frequency of approximately 2.5 failures/1000 km—a substantial improvement over the 1998 benchmark of 5 failures/1000 km;
- 66 contact damage incidents, down from 80 incidents in 2001/2002;
- 563 pipeline corrosion incidents, up from 503 in 2001/2002.

The number of major unsatisfactory inspections increased in 2002 due in part to the implementation of *Guide 66: Pipeline Inspection Manual*, which clarified EUB expectations for identifying and addressing corrosion problems. The increase in pipeline corrosion incidents is mainly attributed to the Swan Hills and Judy Creek Fields, where the pipeline systems had external coating problems due to increased product temperatures. The EUB met with the affected licensees and has approved their action plans for addressing the failures. The EUB will monitor the effectiveness of these action plans in 2003.

The EUB emphasizes reducing pipeline corrosion. We investigate 100 per cent of corrosion failures. As well, sensitive leak detection systems, training and awareness programs, automated shut-in equipment, and pipeline patrols (aerial and ground) being used by industry are working to reduce the effects of pipeline failures.

Spills

The EUB's goal is to minimize the environmental impacts of liquid releases (spills) by working cooperatively with industry and other government agencies.

- 100 per cent of all liquid releases that pose any kind of public safety or environmental threat are inspected. There were 26 such releases in 2002.
- More than 76.9 per cent of liquid releases were low volume, and most were contained on lease.
- 1445 liquid releases were reported in 2002, a slight increase from the 1434 in 2001/2002.
- Over the past five years, the volumes of hydrocarbon and produced water spills have steadily decreased. Spill volumes for hydrocarbon and produced water in 2002 were 5188.8 cubic metres (m^3) and 19164.8 m^3 respectively. This is a reduction from the 2001/2002 release volumes of 5877.3 m^3 hydrocarbon and 19748.0 m^3 produced water.

Air Monitoring

Field Surveillance uses two mobile air monitoring units to assist inspection staff in identifying facilities that emit fugitive emissions. In 2002, the EUB monitored 461 facilities for H_2S and SO_2 emissions, a considerable increase from the 28 facilities monitored in 2001. Industry is improving its compliance record in the area of air emissions from oil and gas facilities; for example, the percentage of unsatisfactory inspections went from 36 per cent in 2001 (10 unsatisfactory inspections out of 28) to 6 per cent from July to December 2002 (13 unsatisfactory inspections out of 227).
In addition to carrying out routine monitoring and responding to complaints, the mobile monitoring units are available for emergency response situations. In 2002, the air monitoring units responded to three emergency situations.

Responding to Public Concerns

One measure of the EUB's performance is our responsiveness to public complaints. Field Surveillance staff respond to all complaints within our jurisdiction. The focus is to ensure prompt, effective, and lasting resolution of any problem identified.

Although the activity level in the oil and gas industry remained high in 2002, there has been a downward trend in complaints, with 869 complaints in 2002, 12 fewer than 2001/2002. Of the individuals surveyed, 91 per cent were satisfied with the response from the EUB, compared to 90 per cent in 2001/2002.

The EUB receives complaints on a variety of issues (see Figure 4 for a distribution of complaints by issue). The most common issue is odours, with 372 odour complaints, 5 more than 2001/2002.

In 2002, Field Surveillance efforts to connect with the community included

- staff involvement totalling 540 days—up from 400 days in 2001/2002—in 198 facilitations, of which 129 were successfully resolved, 44 are ongoing, and only 2 required hearings;
- open houses in Pincher Creek, Bonnyville, and Medicine Hat (attendance was 110, 166, and 110 respectively); and
- staff participation in most of the province's 56 active synergy groups.

The EUB strongly endorses the cooperative approach of synergy groups as an effective way to improve communication and identify and address issues.

Public Safety and Sour Gas

In January 2000, the EUB established a 22-member multistakeholder Advisory Committee on Public Safety and Sour Gas to review Alberta's sour gas regulatory system. The committee made a report of 87 recommendations, 12 of which specifically related to the Field Surveillance Branch's role.

Eight recommendations were completed in 2001/2002 and were incorporated into Field Surveillance inspection processes. One recommendation was acted on in 2002: Recommendation 65 to review air monitoring capability within the province. The remaining three will be completed in 2003.

1 Summary of Inspection Activity, Enforcement Action, Public Complaint Statistics, Stakeholder Involvement Efforts, and Major Initiatives

1.1 Introduction

This *Provincial Summary* report provides readers with information and statistics related to the activities of the Alberta Energy and Utilities Board (EUB/Board) Field Surveillance Branch. Data are analyzed to predict trends used to allocate resources and determine future Field Surveillance actions to improve industry's understanding of and compliance with EUB requirements.

In previous *Provincial Summary* reports, the EUB Field Surveillance reporting year was from April 1 to the following March 31. For 2002 and future years the *Provincial Summary* will report on activities from January 1 to December 31. As a result, incidents reported in the last three months of the previous EUB *Provincial Summary* have been included in this report.

The EUB Field Surveillance Branch has eight Field Centres located throughout the province. In addition, a suboffice of the Bonnyville Field Centre is located in Fort McMurray and a suboffice of the Grande Prairie Field Centre is located in High Level (see Figure 1).

1.2 Role of Field Surveillance Staff

As part of the EUB's overall surveillance and enforcement role, field staff

- respond to and address complaints related to energy development and environmental issues;
- inspect drilling and service rigs, oil and gas production facilities, and pipelines to ensure that licensees are in compliance with all applicable standards, specifications, and approval conditions;

Figure 1. EUB Field Centre boundaries

- take appropriate enforcement action when noncompliance occurs;
- focus on problem licensees with poor inspection records, with the goal of long-term improvements;
- concentrate on higher-risk facilities, such as sour gas wells, pipelines, and facilities located near environmentally sensitive locations;
- respond to oil and gas emergencies;
- monitor the cleanup of oil and salt water spills;
- attend meetings with the public and licensees to assist in resolving issues;
- participate in community meetings to answer questions and provide information about the EUB's regulatory process; and
- educate industry on new and revised requirements.

The following sections summarize Field Surveillance Branch inspections, enforcement, public complaints, stakeholder involvement activities, and other key initiatives.

1.3 Inspections

EUB field inspections are prioritized based on the weighting of three key criteria—*operator* (licensee/contractor) history, site *sensitivity*, and *inherent* risk (OSI)—in regard to the facility/operation. Field staff focus on licensees with previous unsatisfactory inspections, including repeated noncompliance. Sensitivity is determined by whether the facility is in a forested or agricultural area, with an increased inspection emphasis on areas with high numbers of public complaints and high frequency of environmental incidents. The inherent risk of a facility or operation is determined by reviewing specific technical details about the facility, such as the complexity of the operation and whether the facility is sweet or sour.

The total number of initial field inspections decreased slightly, from 8407 during 2001/2002 to 8255 in 2002, due to increased personnel being allocated to facilitation work, training new staff, and the field inspection system initiative (see Section 1.7.2). The percentage of satisfactory inspections increased significantly, from 64 per cent in 2001/2002 to 70.6 per cent in 2002. The minor unsatisfactory inspection percentage remained constant at 25 per cent, while the overall percentage of major and serious unsatisfactory inspections decreased from 4.4 per cent in 2001/2002 to 3.9 per cent in 2002. There was only one serious unsatisfactory inspection in 2002 compared to 11 in 2001/2002.

EUB Action

- Field Surveillance staff will continue to focus on pipeline corrosion, noncompliant licensees, air-monitoring activities, facilitation,[1] and improving communication with synergy groups[2] and First Nations/Metis communities throughout the province.

Throughout this report, the terms "satisfactory" inspection and "minor," "major," and "serious" unsatisfactory inspections are used. It is important that the definition of each is understood to properly interpret the statistics. There are numerous requirements in each inspection discipline, and even if one noncompliance item is identified, the inspection is considered unsatisfactory. The definitions below include those for a minor, major, and serious unsatisfactory event/inspection from *Informational Letter (IL) 99-4: EUB Enforcement Process, Generic Enforcement Ladder, and Field Surveillance Enforcement Ladder* and apply to these terms throughout this report:

- **satisfactory event/inspection**—an inspection where an licensee is in compliance with all regulations/requirements

- **minor unsatisfactory event/inspection**—a contravention of regulation(s)/ requirement(s) that does not result in a direct threat to the public and/or the environment and does not adversely affect oil and gas operations

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[1] When members of the public have concerns about a particular industry project and the parties are having difficulty resolving issues on their own, Field Surveillance staff facilitate the resolution process. They assist to improve communications, information sharing, and identification of issues and options available and to ensure that EUB requirements are understood

[2] To ensure that the impact of resource development and operations is minimized on an ongoing and proactive basis, synergy groups are formed to identify issues and work on collaborative solutions to the problems identified. Synergy groups usually involve public, industry, and appropriate government representatives. EUB staff assist and support the organization of these groups, but the strength and success of the groups lie in the direct involvement of participants.

Examples of minor unsatisfactory inspection items are

- pipeline signage missing, defaced, or displaying incorrect information,
- garbage and debris not stored in a reasonable manner at an oil or gas facility, and
- meter calibrations not completed at an oil and gas facility.

- **major unsatisfactory event/inspection**—a contravention of regulation(s)/ requirement(s) that an licensee has failed to address and/or that has the potential to cause an adverse impact on the public and/or the environment

  Examples of major unsatisfactory inspection items are

  - failure of blowout prevention (BOP) equipment on a drilling or service rig,
  - hydrogen sulphide (H_2S) release causing odours off-lease at an oil battery, and
  - not properly informing stakeholders of proposed development and/or application, as per *Guide 56: Energy Development Application Guide and Schedules.*

- **serious unsatisfactory event/inspection**—a total disregard for regulation(s)/ requirement(s) that is causing or may cause a significant impact on the public and/or environment or fraud

  Examples of serious unsatisfactory inspection items are

  - conducting an activity without an approval where an approval is required,
  - unaddressed release into water, where the licensee was aware but took no action, and
  - blowout prevention equipment missing where required on a drilling or service rig.

Table 1 summarizes the field inspections that occurred in 2002 and includes the number of initial[3] inspections and reinspections[4] in each category. Each inspection category includes the number of satisfactory, minor, major, and serious unsatisfactory inspections.

1.4 Enforcement

The Field Surveillance Branch uses the previously mentioned process detailed in *Informational Letter (IL) 99-4* to ensure that a firm, fair, and consistent approach is taken in all noncompliance situations. Enforcement actions escalate to a higher level if a licensee repeatedly fails to meet EUB requirements. This enforcement process

- improves EUB staff consistency, efficiency, and effectiveness;
- results in increased public safety, minimizes environmental impact, and improves conservation;
- helps create a level regulatory playing field for industry; and
- improves industry accountability.

[3] An initial inspection is the first inspection on a facility in a designated time period.
[4] A reinspection is a follow-up to a deficiency found at a facility during the initial inspection.

Table 1. Field inspections, 2002[1]

	Initial	Satisfactory	Minor unsatisfactory	Major unsatisfactory	Serious unsatisfactory	Reinspection
Drilling rigs	433	388	31	14	0	0
Service rigs	238	223	14	1	0	0
Oil production facilities	3 443	2 204	1 126	113	0	1 258
Gas production facilities	2 170	1 403	716	50	1	827
Pipeline construction/ testing	330	283	40	7	0	31
Pipeline failure inspections	516	456	14	46	0	16
Pipeline operations inspections	186	65	85	36	0	45
Pipeline contact damage inspections	66	46	3	17	0	11
Spill inspections	631	594	23	14	0	0
Waste management facilities	65	35	24	6	0	13
Drilling waste management						
-Nonroutine inspections	67	60	6	1	0	0
-Routine inspections	110	75	17	18	0	0
TOTAL	8 255	5 832	2 099	323	1	2 201

[1] For definitions of minor, major, and serious unsatisfactory inspections, see Section 1.3. Note that details for each inspection category are found in various sections throughout this report.

Licensees that do not comply with the requirements or fail to follow EUB direction are subject to escalating enforcement consequences. A licensee's required response to EUB direction and subsequent continued compliance with regulations result in its compliance status reverting back to satisfactory.

Table 2 summarizes the oil and gas operations that were shut down in 2002 as a direct result of EUB enforcement action and gives the estimated cost to industry (also see Figure 2).

1.5 Public Complaints

1.5.1 EUB Response to Public Complaints

Energy exploration and development activity remained high in 2002. The EUB recognizes that with this activity level there will be associated public concerns. The EUB places a high priority on responding to and effectively addressing these.

Field Surveillance staff respond to all complaints related to upstream oil and gas exploration, production, and disposition activities, with the goal of ensuring prompt, effective, and lasting resolution to related problems identified. When a public complaint is received that is not within the EUB's jurisdiction, the individual with the complaint is promptly directed to the appropriate government agency so the matter can be addressed.

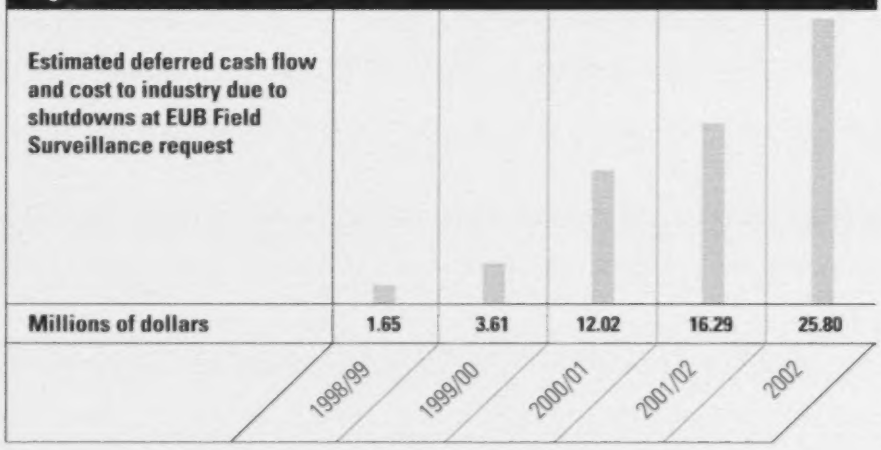
Table 2. Facilities/operations shut down at EUB Field Surveillance request, January 1 to December 31, 2002

Type	Approximate number of suspensions	Average duration of shutdown	Estimated deferred cash flow[1] ($)	Estimated cost ($)	Most common reasons for suspensions
Drilling rigs	14	1.5 hours		31 125	• Operational failure of BOP/accumulator system • Crew training
Service rigs	1	1.5 hours		450	• Operational failure of BOP/accumulator system
Oil production batteries	45	14.6 days	22 700 000		• H_2S emissions • Spills
Gas facilities	16	16.0 days	123 840		• H_2S emissions/secondary containment
Pipelines under construction	11	5.5 days	N/A	200 500	• Ground disturbance activities
Pipelines in operation	41	18 days	1 900 000	845 500	• Corrosion integrity work
Subtotal			24 723 840	1 077 575	
TOTAL	**128**			**25 801 415**	

[1] Compiled using data from EUB Field Centres. Where direct estimates were not available from the involved licensees, cost estimates were as follows: $750/hour for drilling rig time; $300/hour for service rig time; $150/$m^3$ for value of conventional/bitumen oil production; $150/10^3 m^3$ for value of gas production; and $250/hour for pipeline construction down time. Costs of suspensions are as supplied by industry where available. Where necessary, costs were calculated using production reports.

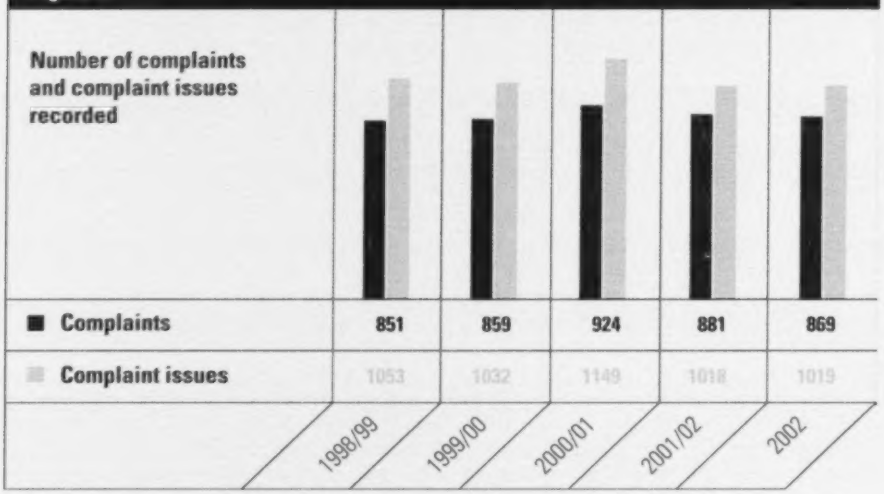
Figure 2

Estimated deferred cash flow and cost to industry due to shutdowns at EUB Field Surveillance request



In 2002, the EUB received and responded to 869 public complaints, compared to 881 in the 2001/2002. Since a number of complaints recorded more than one concern, the EUB identified 1019 issues associated with the 869 complaints, compared to 1018 issues the previous year (see Figure 3).

Figure 3



Although the number of public complaints has not decreased substantially, we will continue our efforts in facilitation, communication, and increased involvement with synergy groups to ensure that public complaints are kept to a minimum.

EUB Action

- The EUB will continue to emphasize the benefits and importance to industry of proactive and continual communication with the public in an effort to reduce the number of complaints.

1.5.2 Complaint Follow-up

In an effort to gauge the level of satisfaction with both EUB and industry responses, Field Surveillance has a random complaint call-back program. The information gathered is analyzed to ensure that appropriate complaint response procedures are being used by the EUB and industry.

Results of the 2002 Complaint Call-Back Survey indicate that

- 64 per cent of individuals contacted said their concerns were satisfactorily resolved, compared to 69 per cent in 2001/2002;
- 56 per cent of the individuals surveyed were satisfied with the licensee response, compared to 62 per cent in 2001/2002; and
- 91 per cent of the individuals surveyed were satisfied with the response from the EUB, compared to 90 per cent in 2001/2002.

EUB Action

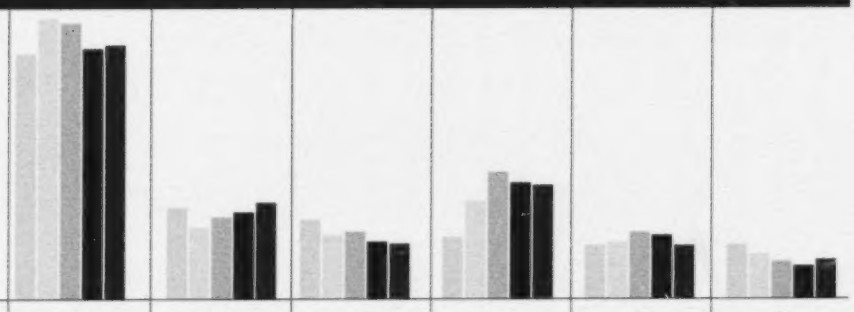
- In 2003, the EUB will continue to target 300 complaints for follow-up to gauge whether the EUB is responding effectively to the public.

1.5.3 Types of Public Complaints

The EUB receives complaints from the upstream petroleum industry on a variety of issues. Four of the most common issues are odours, property/lease management, flaring/smoke, and noise associated with upstream petroleum facilities (see Figure 4). Odour complaints represent 36 per cent of all public complaints received by the EUB in 2002.

Figure 4

Distribution of complaints by most common issues



	Odours	Lease management	Public health and safety	Flare/smoke	Noise	Spills
1998/99	360	134	117	91	79	80
1999/00	412	105	94	144	83	66
2000/01	405	120	99	186	98	55
2001/02	**367**	**127**	**84**	**170**	**93**	**48**
2002	**372**	**141**	**80**	**166**	**78**	**57**

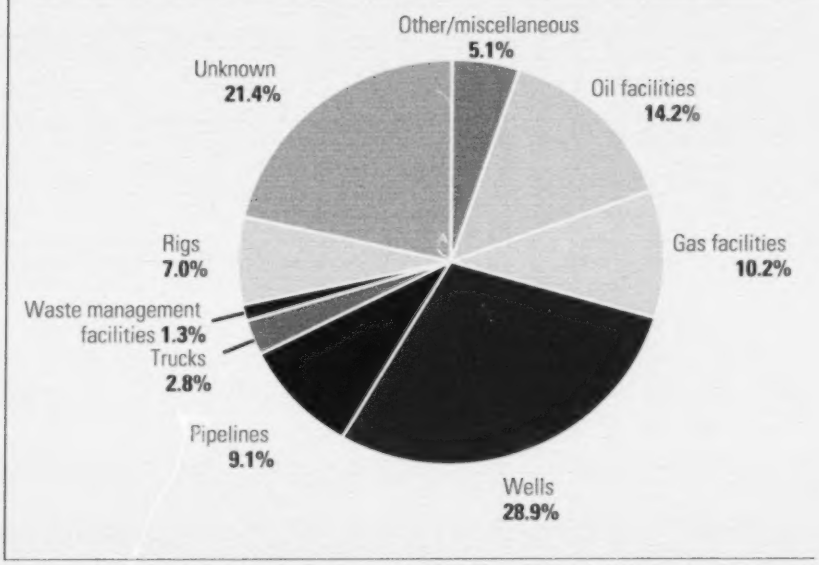
Although the activity level in the oil and gas industry remained high, the number of public complaints received by the EUB decreased marginally when compared to last year. The reduction can be attributed to several factors, such as increased surveillance and air monitoring, enhanced interaction between the public and industry through public meetings and synergy group participation, and educational presentations.

Analysis of data indicates that wells and oil facilities were the largest sources of public complaints, at 43 per cent (see Figure 5).

EUB Action

- Throughout the year, presentations are made to industry outlining the most common sources and causes of public complaints and describing measures required to reduce them. This proactive communication with industry groups and associations and during licensee awareness sessions will continue in 2003. In addition, Field

Figure 5. Public complaints by source, 2002



Surveillance staff will be holding awareness sessions with licensees in sour areas of the province to try to reduce transient H_2S emissions.

1.6 Stakeholder Involvement Activities

1.6.1 Facilitation Efforts

Industry has a responsibility to discuss proposed development projects with affected citizens and identify and address concerns, with limited EUB staff involvement. When issues or concerns arise that have not been resolved satisfactorily, EUB field staff are available to provide guidance and assistance to both parties to

- identify concerns regarding the proposed development,
- assist the public in understanding what the EUB requirements of industry are,
- facilitate the discussion of possible solutions,
- assist the public in understanding the EUB's mandate, and
- ensure understanding of the EUB's Appropriate Dispute Resolution (ADR) program and the hearing process, which are available to both parties.

In 2002, EUB field staff spent 540 days on facilitation efforts. Field staff were involved with 198 facilitations, of which 154 were completed and 129 were successfully resolved. Twenty of the remaining 25 files proceeded to mediation, of which 17 were successfully resolved; 2 went to hearing; and the Board dismissed one. For the remaining 5 files, the applications are either on hold or have been withdrawn by the applicant. These 2002 figures compare to the 400 days spent on facilitation in 2001/2002, when staff were involved with 142 facilitations, with 76 being successfully resolved.

ADR is an option available to stakeholders for disputes regarding both applications and operations. EUB staff will participate in this process upon request.

Numerous presentations, meetings, and workshops have taken place to improve stakeholder understanding of the ADR process, which continues to prove very effective in assisting industry and the public in resolving issues.

1.6.2 Synergy Groups

Synergy groups are another effective means of identifying and addressing issues. These groups are usually made up of public, industry, and government representatives. The size, structure, and membership of a synergy group depends on factors such as population, production type, industry activity, geographical location, and sensitivity of an area. EUB field staff participate in most of these groups and strongly endorse this cooperative approach as an effective way to improve communication and identify and address issues. Table 3 lists 56 active synergy groups located throughout the province.

In February 2002, the EUB, the Canadian Association of Petroleum Producers (CAPP), and industry and community representatives organized a conference to share experiences and learn from synergy group participants throughout the province. The two-day conference was held in Red Deer and drew 248 participants, including representatives from 28 synergy groups and 51 oil and gas licensees, as well as 38 EUB staff, including 5 Board Members and the EUB Chairman.

EUB Action

- In January 2003, the EUB surveyed all synergy groups throughout the province to establish and maintain a database that profiles some of the key information about each group. The survey, which will be completed in 2003, is on the EUB Web site at <www.eub.gov.ab.ca>.

1.6.3 EUB Open Houses

EUB open houses were held in Pincher Creek, Bonnyville, and Medicine Hat in 2002, with total attendance of 110, 166, and 110 respectively. The purpose of an open house is to

- communicate important EUB processes and policies,
- improve working relationships with stakeholders, and
- provide an opportunity for stakeholders to ask questions, express concerns, and solicit solutions to issues.

Open houses offer attendees the opportunity to acquire information about the EUB and to discuss issues they have with Field Centre staff, EUB management, and Board Members. A variety of information is available through displays, handouts, and one-on-one discussions. Open houses include presentations on key processes and policies with a panel that listens and responds to issues and concerns from the audience.

Table 3. Active synergy groups in Alberta

Bonnyville Field Centre
- Alberta Utility Location and Coordination Council
- Lakeland Industry & Community Association (LICA)
- Lakeland Truckers Committee
- Wood Buffalo Environmental Association

Grande Prairie Field Centre
- Chinchaga Operators Synergy
- Clear Hills Surface Rights Association
- County Industrial Operators Group
- Fourth Creek Group
- Greater Kakwa Area Citizens Group
- Hay/Zama Committee
- Peace Air Shed Zone
- Peace Arch Operators Group
- Rainbow Lake Operators
- Saddle Hills Awareness Group
- SPCA Beaverlodge Crime Prevention
- Valleyview Operators Group
- Western Cree Tribal Council

Medicine Hat Field Centre
- Grassland Naturalists
- Shallow Gas Management Association
- Urban Environment and Recreation Advisory Board

Red Deer Field Centre
- Bashaw Community Advisory Group
- Butte Advisory Committee
- Eagle Valley Community Advisory Group
- Harmattan Elkton Community Advisory Committee
- Olds Community Advisory Group
- Panther Advisory Group (PAG)
- Parkland Airshed Management Zone (PAMZ)
- Sundre Petroleum Operator's Group (SPOG)
- Sunchild/Ochiese Mutual Aid Group
- West Central Stakeholders Group

Drayton Valley Field Centre
- Edson Creative Solutions
- Genesee Synergy Group
- Pembina Area Natural Resources Advisory Committee (PANRAC)
- Rider Pembina Advisory Committee
- West Central Air Shed Society

Midnapore Field Centre
- Airdrie and Area Public Petroleum Awareness Alliance (APPA)
- Cochrane Extraction Plant Advisory Committee
- Cochrane Pipeline Operators Committee
- Indus Community Petroleum Industry Association
- Quirk Creek Gas Processing Community Committee
- Shell Waterton Environment Round Table
- Vulcan County Synergy Group

St. Albert Field Centre
- East Parkland Liaison Committee (EPLC)
- Edmonton Area Pipeline Utilities Operators Committee (EAPUOC)
- Fort Air Partnership
- Northeast Central Industrial Association
- Redwater Public/Industry
- Rimbey and Area Multi Stakeholders Group
- Watelet Public/Industry
- West Edmonton Operators Group

Wainwright Field Centre
- Alliance/Brownfield Operators
- Hardisty Pipeline Terminal Committee
- Lloydminster Area Gas Conservation Committee
- Lloydminster Area Operators Gas Migration Team (LAOGMT)
- Provost Area Operators
- SaskAlta Oil Sands Producers

Feedback to date indicates that attendees find open houses worthwhile and effective; therefore, the EUB will continue to hold them.

EUB Action

- In 2003, open houses will be scheduled in locations throughout the province where stakeholder issues and concerns are prevalent. The EUB will continue to measure the effectiveness of these open houses and make improvements as necessary. The EUB is considering modifying the focus of open houses from a Field Surveillance perspective to a corporate EUB perspective.

1.7 Major Initiatives

1.7.1 Advisory Committee on Public Safety and Sour Gas

In January 2000, the EUB established the Advisory Committee on Public Safety and Sour Gas. The 22-member multistakeholder committee was asked to review the regulatory system for sour gas as it relates to public health and safety. More than 1600 Albertans residing in major sour gas development areas in the province were consulted through public outreach sessions, written submissions, and telephone surveys.

A report was published that contained 87 specific recommendations directed at

- improving the understanding of sour gas,
- improving the regulatory processes under which sour gas development is approved and operates,
- reducing the impact of sour gas on public health and safety, and
- improving the consultation processes with the public on all sour gas matters.

Of the 87 recommendations, 12 are directly related to EUB Field Surveillance processes. In 2001/2002, 8 recommendations were completed and incorporated into EUB Field Surveillance business processes. In 2002, one recommendation was initiated in 2002 and is described below. The remaining 3 will be implemented in 2003.

- Recommendation 65 –Review Air Monitoring Capability within the Province

  Action Taken – An inventory of the type, sensitivity, reliability, and location of ambient air monitoring equipment in the province was completed so that in the event of an emergency, an inventory of existing air monitoring equipment is known and available. Guidelines have been drafted for use by EUB staff to ensure that a consistent approach is taken when collecting, analyzing, and disseminating air monitoring results.

EUB Action

- In 2003, the EUB will be implementing the recently developed air monitoring guidelines as monitoring standards in the event of an emergency.
- EUB Field Surveillance will act on the remaining 3 recommendations (77, 78, and 82) in 2003.

More detailed information on the Advisory Committee on Public Safety and Sour Gas is available on the EUB's Web site at <www.eub.gov.ab.ca>.

1.7.2 Field Inspection System

The EUB Field Surveillance Branch continues with the development of a new computerized field inspection system (FIS), which utilizes an automated and integrated approach to field inspection activities and records management. The benefits of this system include

- automation of most industry notifications,
- automation of the prioritized inspection process (OSI),
- improved accuracy of information,
- enhancement of the enforcement process by capturing all inspections under one system,
- automation of key statistics and measures, and
- improved data retrieval and analysis capability.

EUB Action

- Phase 1 of this three-phase project was completed in 2002, while phases 2 and 3 are planned for completion in 2003.

More information on FIS is in *General Bulletin (GB) 2001-19: New Field Inspection System for EUB Field Surveillance Branch.*

2 Drilling and Servicing

2.1 Introduction

As mentioned earlier, for 2002 and future years the *Provincial Summary* will report on activities from January 1 to December 31. As a result, incidents reported in the last three months of the previous EUB *Provincial Summary* have been included in this report.

The EUB is responsible for regulating drilling and servicing operations to ensure public safety, conservation of resources, and protection of the environment. This responsibility is accomplished through existing regulations and requirements, which include conducting inspections, monitoring licensee and contractor performance, evaluating incidents, and applying fair and firm enforcement action in cases of noncompliance.

2.2 Well Control Occurrences

The well occurrence data collected by the EUB assist staff in monitoring industry performance and identify when changes to regulations, inspection procedures, or operating practices may be required.

Kicks, blows, blowouts, and industry's response to these incidents continue to be primary indicators of industry's drilling and servicing performance.

Industry's continued commitment to high training standards for rig personnel in well control and crew training has helped keep well control occurrences to a minimum. These will continue to be high-priority inspection areas for EUB staff.

2.2.1 Drilling—Blowouts[5]/Blows[6]/Kicks[7]

During the drilling of 13 193 wells in 2002,[8] six blowouts occurred (see Table 4). Four were minor in nature and occurred in the first stage of drilling, when no surface pipe or blowout preventers are in place. The remaining two blowouts occurred during normal drilling operations. All blowouts were sweet and of short duration and resulted in minimal environmental damage.

Table 4. Drilling and servicing well control occurrences, 2002

	Drilling	Servicing
Blowouts	6	5
Blows	0	2
Kicks	78	N/A

In 2002, there were 78 kicks recorded. This equates to a kick occurrence rate of approximately 6 kicks per 1000 wells drilled. This kick occurrence rate has remained relatively constant for the last five years and is a significant improvement from the years prior to 1997/1998, when the rate averaged 23 kicks per 1000 wells drilled.

2.2.2 Servicing—Blowouts/Blows

In well servicing operations, a total of five blowouts and two blows occurred in 2002 (see Table 4). Four of the blowouts and the two blows were sweet gas releases. The remaining blowout resulted in a release of sour gas to atmosphere. All of the blowouts were of short duration and were successfully brought under control with minimal environmental damage.

EUB Action

- The EUB will continue to analyze the causes and effects of all blows and blowouts to identify changes to equipment, procedures, or regulations to eliminate occurrences of this nature.

2.3 Drilling—Activity Levels, Inspections, and Inventory

A total of 13 193 new wells were drilled in 2002.[8] This compares to the 14 307 wells drilled in Alberta during the 2001/2002 reporting year (see Table 5).

The number of new wells drilled brings the total number of nonabandoned wells in Alberta to 166 533.

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[5] Blowout—The complete loss of control of the flow of fluids (gas, oil, water, mud) from a well. Control can only be regained by installing or replacing equipment to permit shut-in or killing the well or by drilling a relief well.

[6] Blow—The unexpected release of wellbore fluids (gas, oil, water, mud) to the atmosphere. The flow can be controlled almost immediately by shutting the well in using wellhead valves or blowout prevention equipment or by directing the flow to the flare system until the well is killed.

[7] Kick—During drilling operations, any unexpected entry of water, gas, oil, or other formation fluid into a wellbore that is under control and can be circulated out.

[8] For the purpose of this report, drilling activity includes spuds (new well starts) and re-entries into existing wells; it does not include completions of wells spudded in previous years.

2.4 Drilling—Inspections

The EUB prioritizes all drilling rig inspections based on a point system that includes *operator* (licensee/contractor) performance, site *sensitivity*, and *inherent* risk (OSI; see Section 1.3). EUB field staff apply consistent enforcement action for noncompliance to increase industry awareness and accountability.

During 2002, EUB field staff conducted 433 inspections on drilling operations, resulting in 388 satisfactory inspections (89.6 per cent) and 45 unsatisfactory inspections (10.4 per cent). All unsatisfactory items were brought into compliance. This compares to the previous year's results, when 10.3 per cent of inspections were recorded as unsatisfactory.

The EUB inspects all critical sour wells that are drilled at least once during or immediately prior to drilling the critical zone. In 2002, the EUB conducted 31 critical sour well drilling inspections. Of those, there were 29 satisfactory inspections and 2 minor unsatisfactory inspections. There were no major or serious deficiencies recorded. All unsatisfactory items were brought into compliance.

Table 5. EUB drilling inspection results and activity

	1998	1999/00	2000/01	2001/02	2002
Wells drilled*	7 094	11 548	14 621	14 307	13 193
Drilling rigs inspected	696	631	648	499	433
% inspected	9.8	5.5	4.4	3.5	3.3
% satisfactory	85.0	87.1	87.7	89.7	89.6
% unsatisfactory (minor, major, and serious)	15.0	12.9	12.3	10.3	10.4

* For the purpose of this report, drilling activity includes spuds (new well starts) and re-entries into existing wells; it does not include completions of wells spudded in previous years.

EUB Action

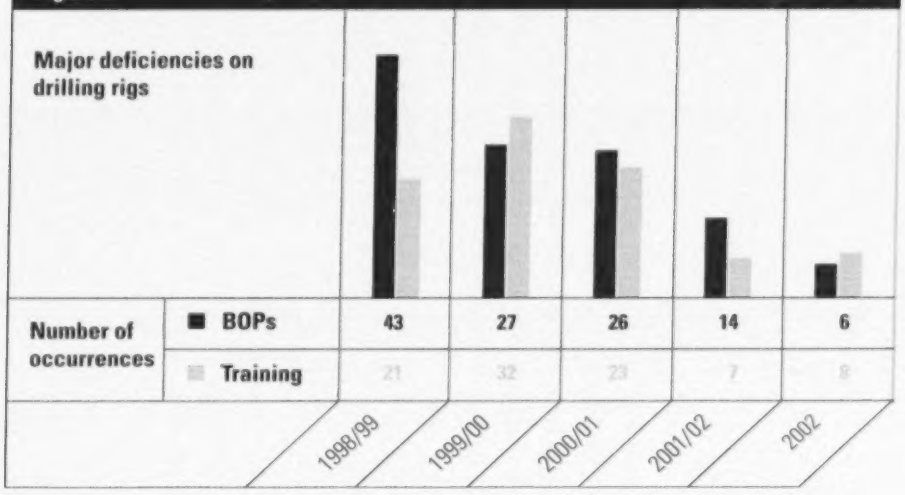
- EUB field staff will continue to make presentations to oil and gas licensees and drilling contractors to ensure that EUB regulations and requirements are understood.

2.4.1 Drilling—Major/Serious Unsatisfactory Items

There were 14 major unsatisfactory inspections out of the 433 drilling inspections conducted in 2002 (see Section 1.3 for definitions of satisfactory inspection and minor, major, and serious unsatisfactory inspections). There were no serious unsatisfactory drilling inspections in 2002. Operational failures of the BOP/accumulator systems resulted in 6 of the major unsatisfactory items, while deficiencies in crew training accounted for the remaining 8 major unsatisfactory items (see Figure 6). This was an improvement over 2001/2002, when 14 failures of the BOP/accumulator systems and 7 deficiencies in crew training were noted.

Drilling operations were suspended at all rigs with major unsatisfactory items until the deficiencies were corrected. This resulted in 14 rig shutdowns, totalling approximately 21 hours, compared to 2001/2002, when 19 rig shutdowns totalled 171 hours.

Figure 6



2.5 Servicing—Activity Level

2002 was a busy year for well servicing activity in Alberta. This was in part due to the number of new wells drilled during the year.

2.5.1 Servicing—Inspections

In 2002, EUB field staff conducted 238 inspections on well servicing operations, resulting in 223 satisfactory inspections (93.7 per cent) and 15 unsatisfactory inspections (6.3 per cent). All unsatisfactory items were brought into compliance. This compares to 262 inspections in 2001/2002, which resulted in 237 satisfactory inspections (90.5 per cent) and 25 unsatisfactory inspections (9.5 per cent) (see Table 6).

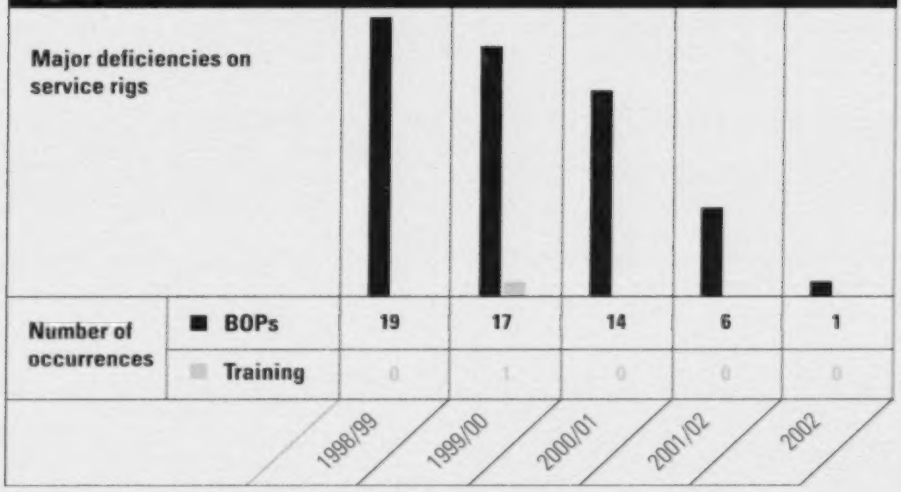
Table 6. EUB servicing inspection results

	1998/99	1999/00	2000/01	2001/02	2002
Service rigs inspected	392	350	348	262	238
% satisfactory	87.8	89.7	87.1	90.5	93.7
% unsatisfactory (minor, major, and serious)	12.2	10.3	12.9	9.5	6.3

2.5.2 Servicing—Major/Serious Unsatisfactory Items

Of the 15 unsatisfactory inspections recorded in 2002, one resulted in a major unsatisfactory inspection, with one major unsatisfactory inspection item noted. This is a significant improvement over 2001/2002, when 6 major unsatisfactory inspections, with a total of 6 major deficiencies, were noted. Operational failure of the BOP/accumulator system accounted for the only major deficiency recorded in 2002 (see Figure 7), which is a significant improvement over 2001/2002, when 6 operational failures of the BOP/accumulator systems were noted. There were no serious unsatisfactory inspections recorded in 2002, compared to one serious unsatisfactory inspection in 2001/2002.

Figure 7



Servicing operations were suspended at the rig with a major unsatisfactory item until the deficiency was corrected. This resulted in a rig shutdown totalling 1.5 hours, a significant improvement compared to 2001/2002, when 7 rig shutdowns totalled 126 hours.

EUB Action

- EUB field staff will continue to make presentations to oil and gas licensees and well servicing contractors to ensure that EUB regulations and requirements are understood.

2.6 Public Complaints—Drilling and Servicing

During 2002, EUB field staff investigated 57 public complaints related to the drilling and servicing of wells. The cause of the complaints varied and included such issues as noise, odours, and dust created by drilling and service rig traffic. This compares to 2001/2002, when 59 public complaints were received for similar issues.

Public complaints remain an EUB priority. The EUB immediately investigates all public complaints related to the drilling and servicing of wells in Alberta and ensures that appropriate action is taken.

2.7 Inspection Manual Reviews—Drilling and Servicing

EUB Action

- The EUB is currently updating both *Guide 36: Drilling Rig Inspection Manual* and *Guide 37: Service Rig Inspection Manual*. Drafts of both guides are expected to be available in the fall of 2003 for stakeholder review.

3 Oil Production

3.1 Introduction

As mentioned earlier, for 2002 and future years the *Provincial Summary* will report on activities from January 1 to December 31. As a result, incidents reported in the last three months of the previous EUB *Provincial Summary* have been included in this report.

EUB staff spend a significant amount of time conducting licensee awareness sessions to increase industry's understanding of EUB requirements and the consequences for noncompliance. These sessions typically include a review of EUB *Guide 64: Facilities Inspection Manual, Guide 60: Upstream Petroleum Industry Flaring Guide,* and *IL 99-4: EUB Enforcement Process.*

Field Surveillance staff will continue to monitor licensees with high minor unsatisfactory inspection rates, with the goal of improving compliance.

Each year significant resources are required to respond to public complaints related to oil production facilities. Licensees need to continue to ensure that regular equipment maintenance occurs to minimize facility upsets that result in impacts to the public.

3.2 Reduction in Potential Public Liabilities from Suspended and Derelict Facilities

The EUB's facility licensing initiative is now complete. All facilities have been licensed, and screening criteria have been developed to assess the financial capability of each licensee for well and facility abandonment and reclamation activities. Those licensees that fail the screening criteria are required to submit a security deposit to the EUB to cover abandonment costs.

EUB Action

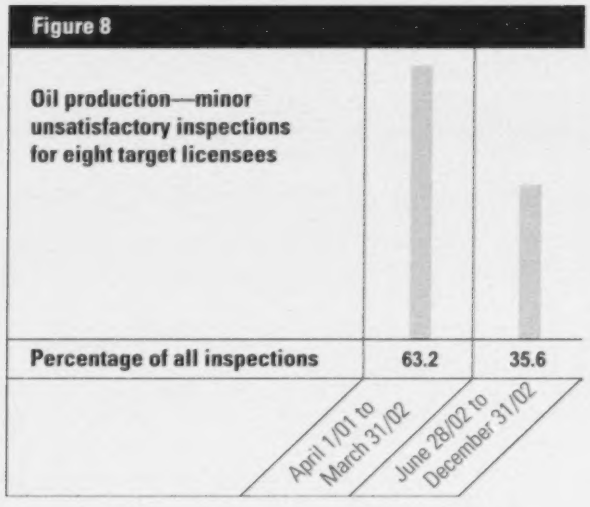
- The process to address potential public liabilities is now in place and will be administered by the EUB's Corporate Compliance Group.

3.3 Licensees with High Minor Unsatisfactory Inspection Rates

The process to identify licensees with a minor unsatisfactory inspection rate that is significantly above the industry average is described in *IL 99-4: EUB Enforcement Process*. The EUB identified eight licensees that had a minor unsatisfactory inspection rate greater than 50 per cent between April 1, 2001, and March 31, 2002. EUB staff met with each licensee to review its inspection record, developed an action plan to address the high minor unsatisfactory rate, and outlined the escalating enforcement consequences that would occur if the inspection record did not show significant improvement.

From April 1, 2001, to March 31, 2002, the eight licensees had a combined total of 185 initial inspections. Minor unsatisfactory conditions were found at 117 oil production facilities, resulting in a 63.2 per cent unsatisfactory rate. After reviewing the individual inspection records with each of the eight licensees, 205 initial inspections were conducted on their facilities between June 28, 2002, and December 31, 2002. Minor unsatisfactory conditions were identified at 73 facilities, resulting in a 35.6 per cent unsatisfactory rate (see Figure 8). Further improvements are expected as these licensees implement additional measures to ensure compliance.

Figure 8


Oil production—minor unsatisfactory inspections for eight target licensees
Percentage of all inspections
63.2
35.6
April 1/01 to March 31/02
June 28/02 to December 31/02

Measures taken by these licensees to improve their compliance rate included

- conducting independent third-party inspections and self-audits at their facilities and notifying the EUB of any noncompliance items;
- conducting meetings with trucking firms to inform them of the necessity of maintaining a clean operation; and
- conducting meetings with licensee personnel and contract operators to ensure that they are aware of EUB requirements.

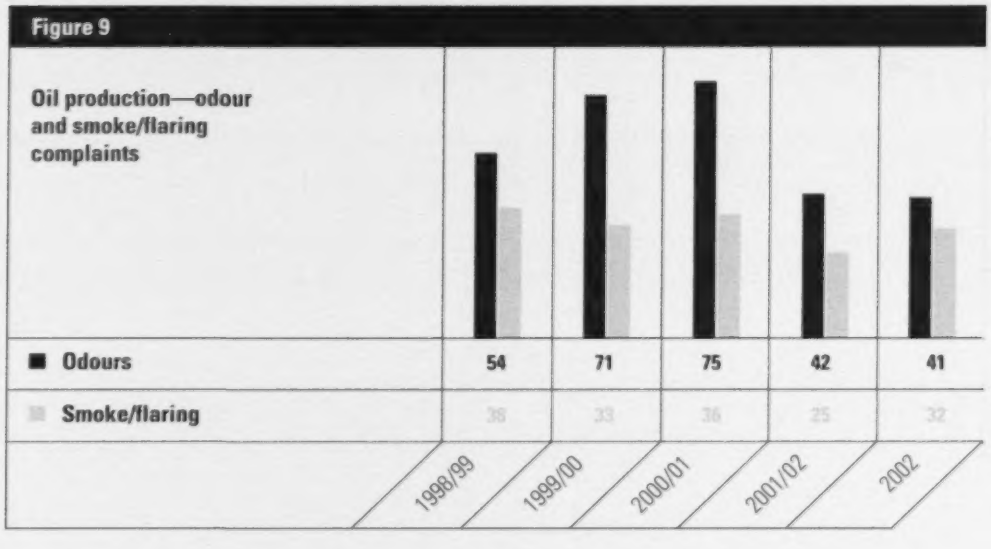
EUB Action

- The EUB will continue to meet with licensees that have significantly high minor unsatisfactory rates to ensure that procedures are implemented to improve their compliance record.

3.4 Public Complaints

During 2002, there were 108 public complaints related to oil production facilities. Every complaint was investigated; where there was noncompliance, appropriate enforcement was applied. There were 73 public complaints related to odours, flaring, and smoke, compared to 67 similar complaints in 2001/2002 (see Figure 9).

Figure 9



Investigation of these complaints identified the most common causes of odours to be

- vapour recovery units undersized to handle stock tank vapours;
- thief hatches not sealing properly; and
- improper trucking practice when hauling sour fluids.

The most common causes of flaring and smoke were

- incomplete combustion of solution gas; and
- solution gas flaring associated with planned/emergency shutdowns

The EUB requires licensees to investigate all sources of emissions and install equipment or use other technology to reduce emissions. In addition, licensees are required to closely monitor operations and improve communications with area residents.

The EUB reviews the public complaint history of each oil production facility to determine if there have been repeat complaints. If there have been, EUB field staff take additional action as necessary to achieve lasting improvement.

During 2002, 15 oil facilities were identified as having repeat complaints. These were related to odours, flaring, smoke, noise, spills, and lease management. Repairs and facility upgrades were made by the licensees to remedy the problems.

EUB Action

- The EUB has increased the inspection frequency at sour facilities that have had major or serious unsatisfactory inspections. The increased inspections will continue, and the results will be reported as part of our overall facility inspection statistics.

3.5 Inventory, Activity Level, and Inspections

The current inventory of conventional oil and crude bitumen batteries/satellites has increased from previous years and is as follows:

- sweet multiwell batteries 1555
- sour multiwell batteries 673
- sweet single well batteries 8530
- sour single well batteries 1212
- sweet satellites batteries 3115
- sour satellites batteries 1442

Figure 10 shows the inventory of oil batteries and associated satellites, the number of battery/satellite inspections, and the percentage found to be satisfactory since 1998/1999 (see Section 1.3 for definitions of satisfactory inspection and minor, major, and serious unsatisfactory inspections). The battery and satellite inspections conducted in 2002 had a 64.0 per cent satisfactory inspection rate, consistent with the previous year's satisfactory inspection rate. Of the 36.0 per cent unsatisfactory inspections, 32.7 per cent were minor unsatisfactory inspections.

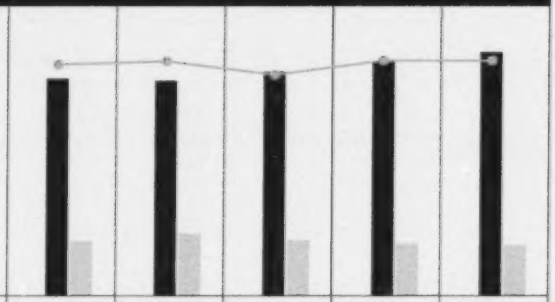
Using the OSI[9] priority inspection process, EUB staff conducted 3443 battery and satellite inspections in 2002. This compares to the previous year, when 3562 inspections were conducted.

There were 113 major unsatisfactory inspections and no serious unsatisfactory inspections in 2002. As a result of major unsatisfactory inspections, 45 oil production facilities were suspended. Appropriate enforcement action was taken on the remaining facilities to bring them into compliance. This compares with 144 major/serious unsatisfactory conditions identified in the 3562 inspections conducted in 2001/2002.

[9] As stated in Section 1.3, the EUB conducts inspections based on priority selection criteria that include *operator* (licensee/contractor) performance history, site *sensitivity*, and *inherent* risk of the operation (OSI).

Figure 10

Oil production–inventory, facility inspections, and percentage satisfactory

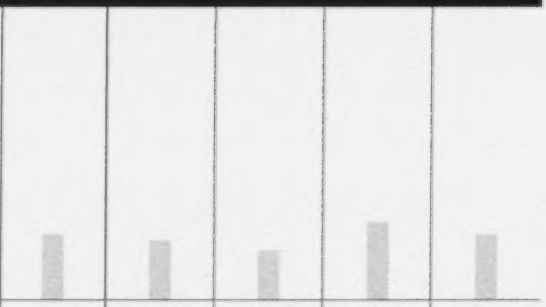


	1998/99	1999/00	2000/01	2001/02	2002
Inventory	14 787	14 634	15 261	15 911	16 527
Facility inspections	3 727	4 235	3 794	3 562	3 443
Percentage satisfactory	63.0	63.9	60.2	64.0	64.0

Figure 11 shows the percentage of battery/satellite inspections with major/serious unsatisfactory inspections since 1998/1999.

Figure 11

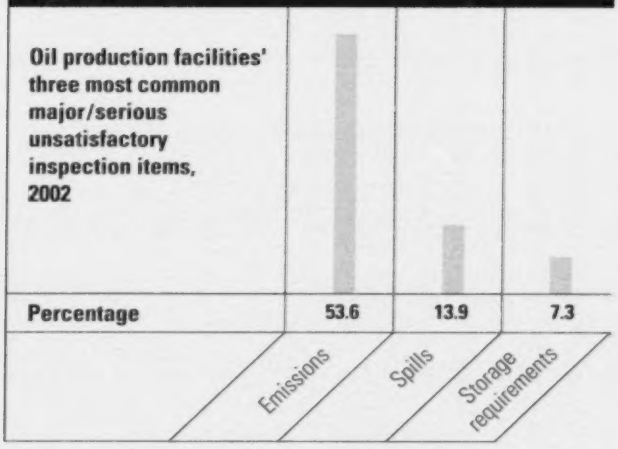
Oil production facility inspections with major/serious unsatisfactory inspection items



	1998/99	1999/00	2000/01	2001/02	2002
Percentage	3.3	3.0	2.5	3.9	3.3

The three most common major/serious unsatisfactory inspection items found in 2002 are shown in Figure 12.

Figure 12



The most common major/serious unsatisfactory inspection items were

- equipment failure resulting in H_2S emissions off lease;
- licensee not appropriately cleaning up spills; and
- no dike installed around the production tanks, resulting in inadequate secondary containment.

All noncompliant inspections were dealt with in accordance with *IL 99-4: EUB Enforcement Process*. The EUB will continue to meet with licensees to discuss inspection results, focusing on identifying the most common unsatisfactory items and finding solutions to improve licensee compliance.

EUB Action

- Sour facility inspections with site-specific emergency response plans were focused on in 2002. The EUB contacted residents to ensure they were aware of the requirements of the emergency plan. These residents were also provided with copies of the EUB facility inspection results. This process will continue in 2003.
- The EUB has two mobile air monitoring units that are used for routine and emergency monitoring. The EUB will continue to monitor facilities for off-lease H_2S emissions. Results of the air monitoring are reported in Section 6: Environment.

Minor unsatisfactory conditions were found in 1126 of the 3443 inspections (32.7 per cent) in 2002. All unsatisfactory inspection items were brought into compliance. This compares with 1145 minor unsatisfactory conditions in 3562 inspections (32.0 per cent) for the previous year. The most common minor unsatisfactory items found in 2002, shown in Figure 13, were

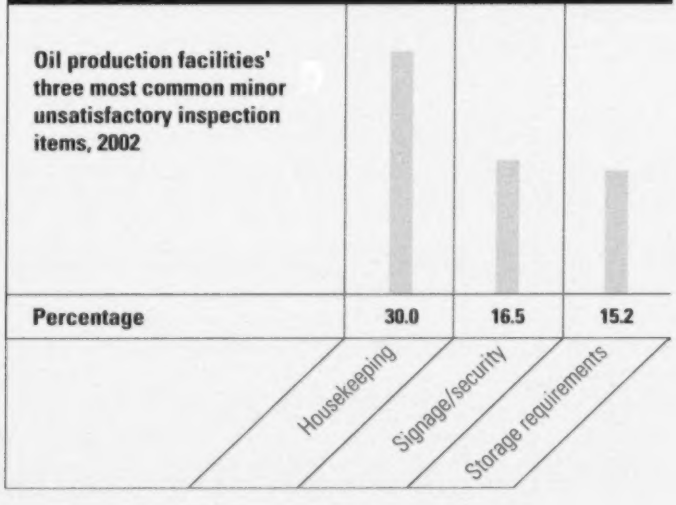
- housekeeping
  - garbage and debris not stored properly
  - oil-stained areas on lease not cleaned up

- signage/security
  - no identification or warning signs posted
  - fencing not adequate

- storage requirements
  - no spill control devices at fluid transfer points
  - improper storage of containers

Figure 13

Oil production facilities' three most common minor unsatisfactory inspection items, 2002



3.6 Commercial Oil Sands Initiative

The draft of the oil sands inspection guide has been completed. The EUB Resources Applications Group is continuing to work on the guide and evaluate the level of EUB presence necessary in Fort McMurray, as a result of the increased commercial oil sands development.

EUB Action

- The EUB Resources Applications Group is working on this initiative.

3.7 Inspection Manual Review

EUB Action

- *Guide 64: Facility Inspection Manual* was updated in July 2002.

4 Gas Production

4.1 Introduction

As mentioned earlier, for 2002 and future years the *Provincial Summary* will report on activities from January 1 to December 31. As a result, incidents reported in the last three months of the previous EUB *Provincial Summary* have been included in this report.

EUB Field Surveillance staff achieved record levels of inspections on gas facilities in 2002. These inspections targeted gas plants, gas batteries, and gas well tests. Inspections were conducted using the following OSI criteria:

- *operator* (licensee/contractor) inspection history
- site *sensitivity*
- *inherent* risk

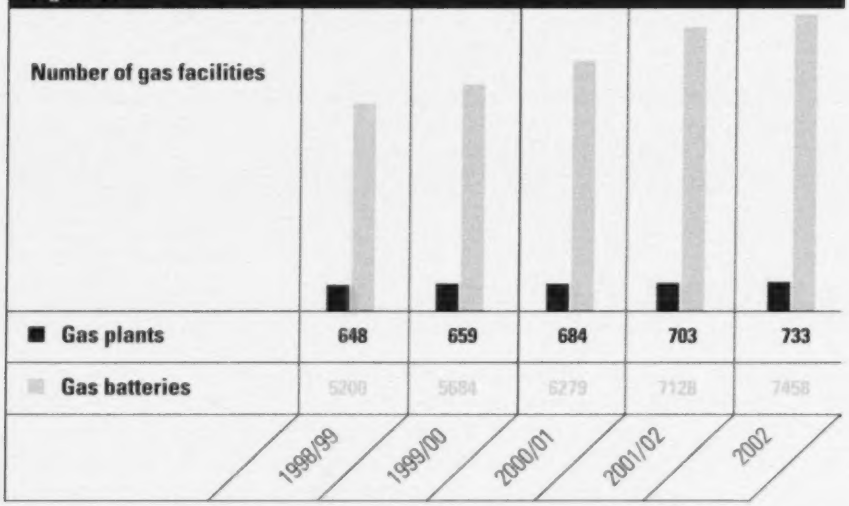
The EUB believes that increases in the level of surveillance and industry awareness contributed to the decrease of major unsatisfactory inspections to the lowest percentage level since the inception of the EUB enforcement ladders in 1999.

4.2 Inventory, Activity Level, and Inspections

There were 69 695 gas wells producing in Alberta in 2002, an increase of 4881 wells over 2001/2002. This resulted in an increase in gas batteries, which totalled 7458 (see Figure 14).

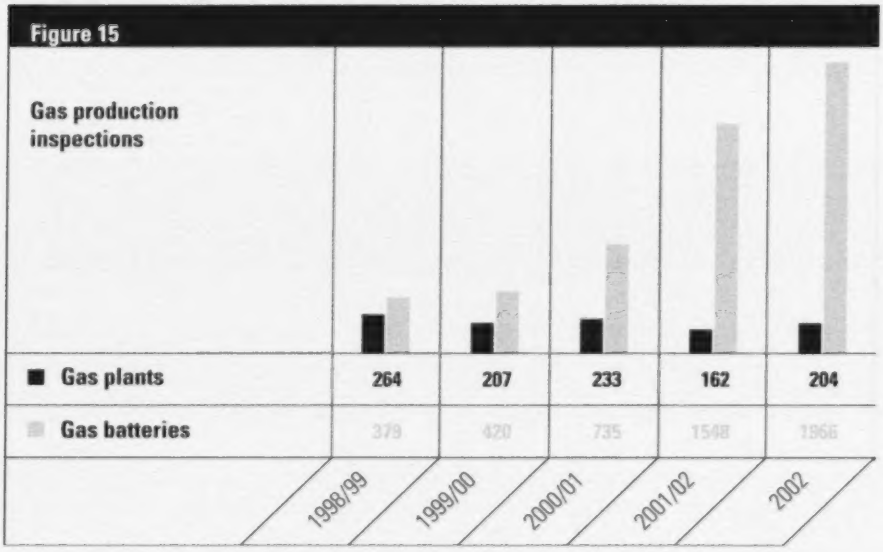
The number of gas plants increased slightly, as shown in Figure 14. In 2002, there were 733 gas plants operating in the province, including 47 sulphur recovery gas plants, 31 sour gas plants with acid gas injection schemes, and 23 acid gas flaring plants (flaring more than 1 tonne per day).

Figure 14



There were 2170 inspections completed on gas processing facilities in 2002, which is a significant increase compared to 2001/2002, when 1710 inspections were conducted (see Figure 15). In 2002, EUB field staff conducted 105 inspections of well tests to ensure compliance with *Guide 60: Upstream Petroleum Industry Flaring Guide*. This is a decrease from 122 inspections in 2001/2002.

Figure 15



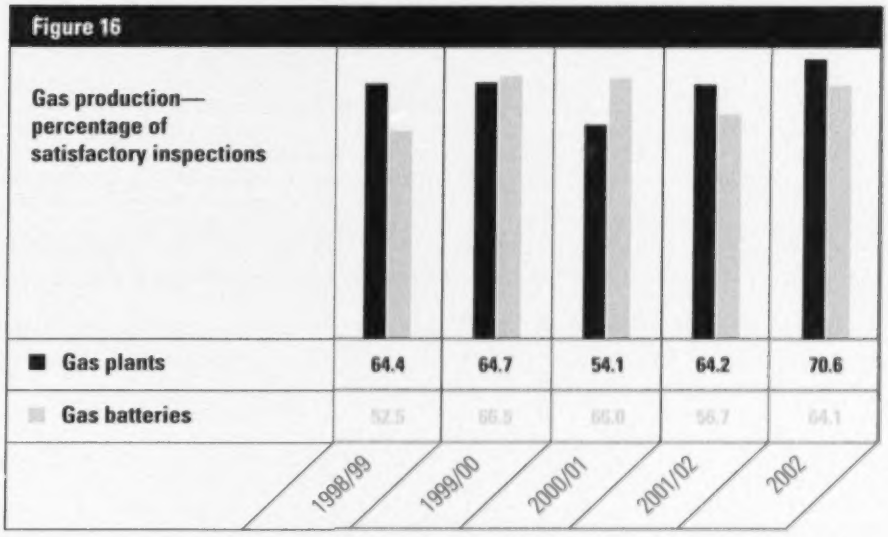
EUB Action

- The EUB will continue to adjust its gas processing facility and gas well test inspection levels as necessary to ensure continued improvement in the level of compliance. In addition, EUB staff will focus inspections on gas gathering systems (compressor stations) in 2003.

4.3 Compliance Levels

The satisfactory inspection percentage increased in 2002 for both gas plants and gas batteries. (See Section 1.3 for definitions of satisfactory inspections and minor, major, and serious inspections.) The gas plant percentage increased from 64.2 per cent in 2001/2002 to 70.6 per cent in 2002. The gas battery percentage increased from 56.7 per cent in 2001/2002 to 64.1 per cent in 2002 (see Figure 16). Similarly, satisfactory follow-up inspections for gas production facilities increased from 98.3 per cent in 2001/2002 to 99.2 per cent in 2002 (see Figure 17).

Figure 16



The major unsatisfactory inspection percentage decreased from 4.3 per cent in 2001/2002 to 2.3 per cent in 2002 (see Figure 18). This decrease can be attributed to the EUB enforcement process and industry's increased understanding of EUB requirements. One serious unsatisfactory inspection was recorded in 2002. All facilities were brought into compliance.

EUB staff completed 15 operational audits of gas plants in 2002. Of these, 6 had satisfactory inspections and 9 had minor unsatisfactory inspections. There were no major or serious unsatisfactory operational audits.

Figure 17

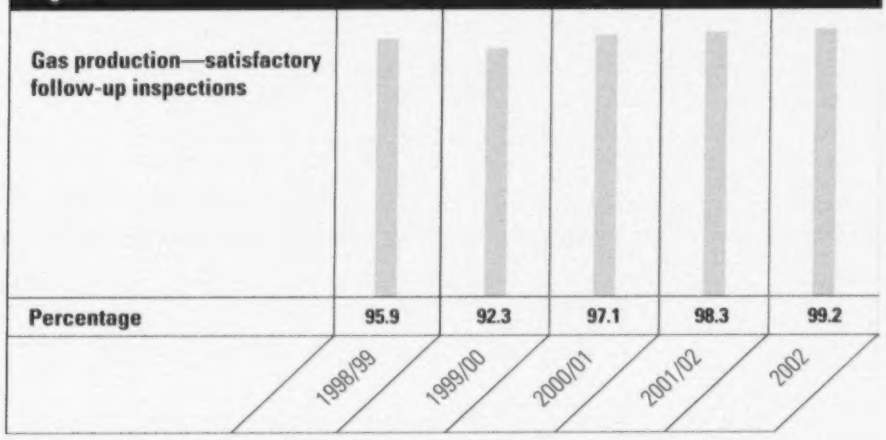
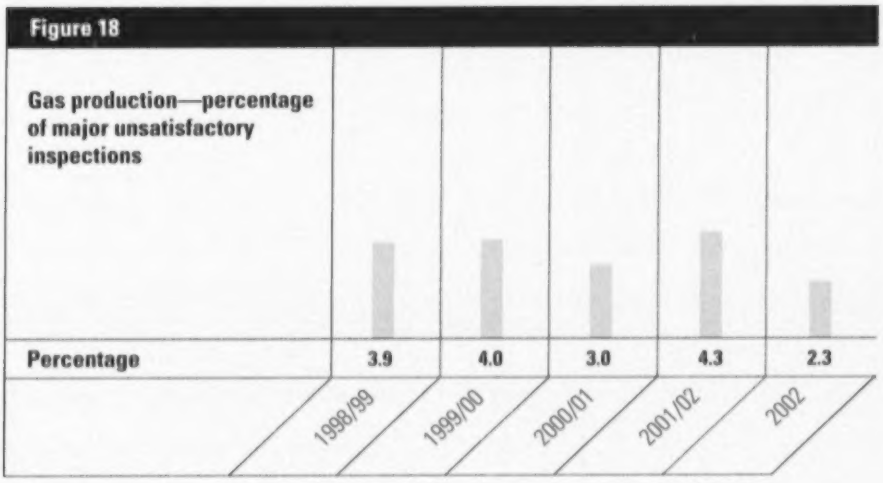


Figure 18

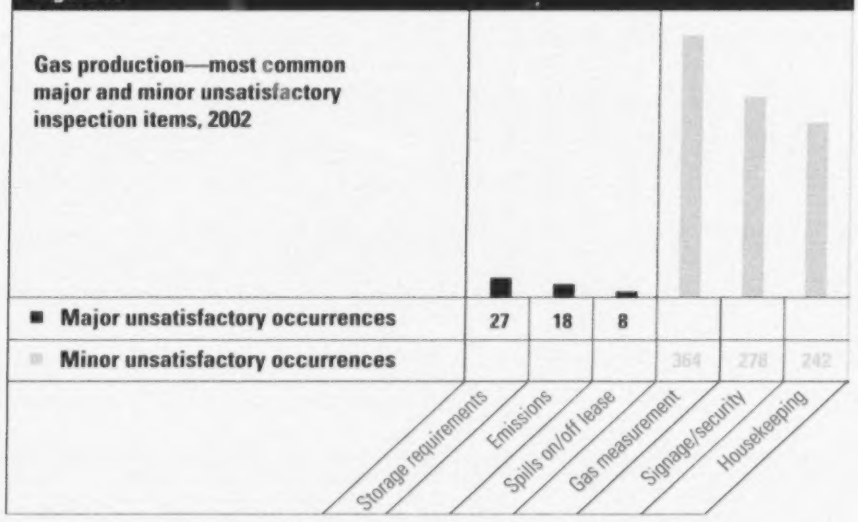


Noncompliance with storage requirements (no tank dikes), off-lease sour gas emissions, and unaddressed hydrocarbon spills were the most common major deficiencies, accounting for 88.3 per cent of all major unsatisfactory inspections during 2002 (see Figure 19). Gas measurement problems, improper lease signage, and poor housekeeping practices accounted for 40.7 per cent of all minor deficiencies recorded. Lack of public and/or EUB notifications were the most common problems associated with sweet and sour gas well test flaring operations.

EUB field staff focused on licensee awareness and education programs. These presentations and information sessions improve industry's understanding of and compliance with regulatory requirements and public expectations.

Figure 19

Gas production—most common major and minor unsatisfactory inspection items, 2002



4.4 Gas Plant Flare Surveillance Program

Gas plants operating in Alberta are allowed to flare 1.0 per cent of the plant inlet volume in the first year of operation and 0.5 per cent of inlet volume in subsequent years.

EUB Action

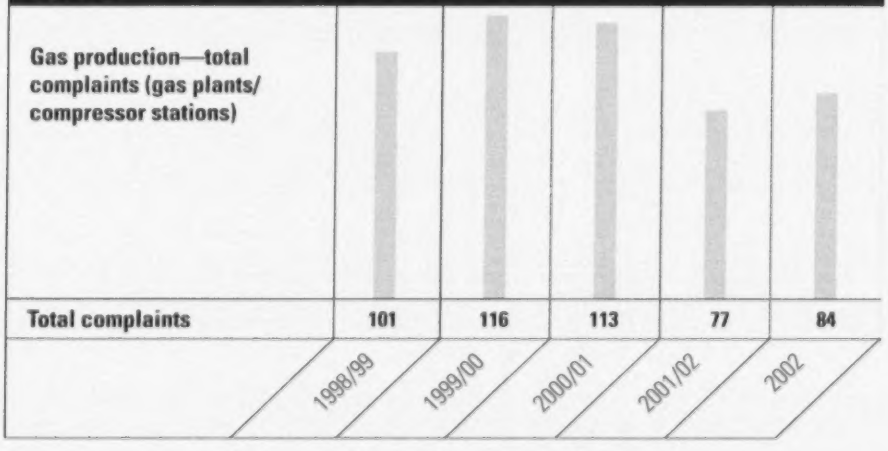
- A review of the flare surveillance program of all plants is currently under way and will be completed in 2003.

4.5 Public Complaints

The number of public complaints from gas processing facilities (gas plants and compressor stations) increased from 77 in 2001/2002 to 84 in 2002 (see Figure 20). In addition, 152 complaints were directed at gas well installations. This compares to 179 complaints regarding gas well installations in 2001/2002.

Figure 20

Gas production—total complaints (gas plants/ compressor stations)



The impact gas processing facilities have on the public continues to be of concern to the EUB. Fugitive emissions, noise from compressors, flaring, and black smoke are the primary issues affecting the public.

The EUB, in consultation with the Clean Air Strategic Alliance (CASA) Flaring/Venting Project Team, is currently revising *Guide 60: Upstream Petroleum Flaring Guide*, which addresses a broad range of flaring and venting issues in Alberta. Inspections and audits of well test flaring operations will continue to be a priority. EUB field staff will focus on flaring operations in populated areas and those wells flaring more than 5 per cent H_2S.

EUB Action

- The EUB will increase the number of gas plant operational audits in 2003 to identify issues before the public is affected.

4.6 Sulphur Recovery

Sulphur recovery efficiencies at gas plants recovering salable sulphur has improved to 98.9 per cent. Overall, sulphur emissions have decreased by 18 per cent since 2000 (from 78 000 to 64 000 tonnes of sulphur emissions). This decrease is due to the declining sulphur inlets at these plants and the EUB/Alberta Environment *Interim Directive (ID) 2001-3: Sulphur Recovery Guidelines for the Province of Alberta*, which has resulted in improved performance (see Figure 21).

The sulphur recovery ID details the requirements when a plant is required to be relicensed to meet the new sulphur recovery standards. In the last two years, 8 sour gas plants have been relicensed to meet the new standards. For 6 of these plants, it has meant the addition of significant new equipment.

The ID allows licensees of plants with sulphur recovery to take immediate advantage of performance improvements to delay the full relicensing requirements. To date, 20 of the 28 sulphur recovery plants are proactively reducing sulphur emissions.

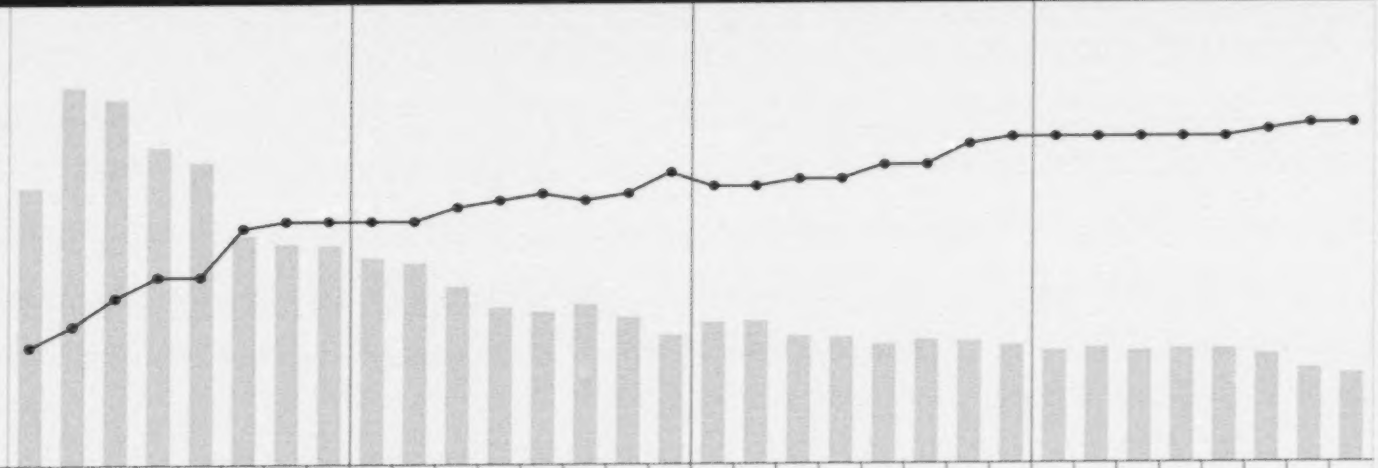
4.7 Inspection Manual Review

EUB Action

- The revised *Guide 64: Facility Inspection Manual* was released in July 2002.

Figure 21

Efficiency versus emissions of sulphur recovery plants



■	**Sulphur emissions** (thousand tonnes)	200	273	264	229	216	165	159	158	149	145	128	113	110	115	105	93	102	103	92	91	86	89	88	85	81	83	81	82	82	78	68	64
●	**Recovery efficiency** (percentage)	**95.7**	**95.0**	**96.4**	**96.7**	**96.7**	**97.4**	**97.5**	**97.5**	**97.5**	**97.5**	**97.7**	**97.8**	**97.9**	**97.8**	**97.9**	**98.2**	**98.0**	**98.0**	**98.1**	**98.1**	**98.3**	**98.3**	**98.6**	**98.7**	**98.7**	**98.7**	**98.7**	**98.7**	**98.7**	**98.8**	**98.9**	**98.9**
	Year	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002

5 Pipeline

5.1 Introduction

As mentioned earlier, for 2002 and future years the *Provincial Summary* will report on activities from January 1 to December 31. As a result, incidents reported in the last three months of the previous EUB *Provincial Summary* have been included in this report.

Pipeline failures continue to be one of the largest sources of environmental contamination. A number of licensees have implemented integrity management programs with the goal of reducing their pipeline failure occurrence rate. Field Surveillance will be monitoring these programs to identify if there is merit in implementing similar programs with licensees that have high failure occurrence rates.

Licensees operating pipelines in Alberta are responsible for complying with all applicable standards and EUB regulations.

EUB field staff conduct inspections based on the following OSI criteria:

- *operator* (licensee/contractor) inspection history
- site *sensitivity*
- *inherent* risk

Inspection processes are in place to monitor compliance and apply enforcement measures for noncompliance. (See Section 1.3 for additional information on the EUB's inspection criteria and for definitions of satisfactory inspection and minor, major, and serious unsatisfactory inspections.) During the past year, when major or serious unsatisfactory inspection items were found, the pipeline was suspended until appropriate remedial action was taken (see Table 2, page 6).

The EUB field staff focus their activities on four key inspection areas:

1) **Pipeline failures/hits**—The Alberta Pipeline Act requires all licensees of pipelines to report any pipeline failures/hits to the EUB regardless of the cause, magnitude, or consequence. EUB field staff verify the cause of the failure/hit and ensure that mitigative measures are taken to prevent future failures/hits.

2) **Construction and pressure testing**—EUB field staff conduct inspections on new pipeline installations to ensure compliance with the requirements.

3) **Operations inspections**—EUB field staff conduct inspections on existing pipeline systems to ensure that licensees conduct operational and maintenance activities in accordance with the requirements (maintenance of valves, cathodic protection systems, corrosion monitoring and control systems, right-of-way and warning signs, emergency contact numbers, etc.).

4) **Contact damage**—EUB field staff inspect sites where pipeline contact damage has occurred. Awareness seminars are held for licensees and contractors to educate them on requirements that must be met prior to commencing ground disturbance activities to reduce incidents of pipeline hits, enhance public safety, and mitigate environmental impacts.

The length and type of permitted pipelines in Alberta under EUB jurisdiction for 1996-2002 are listed in Table 7.

Table 7. Length of permitted pipelines by type in Alberta under EUB jurisdiction, 1996-2002 (km)

Year	Crude oil	Natural gas	Sour gas	Water	Multiphase	Others	Total
Total prior to 1996	13 126	122 283	8 003	14 021	33 501	16 148	207 081
1996	393	7 082	870	631	1 864	948	11 787
1997	938	9 798	1 377	1 225	3 058	1 550	17 947
1998	663	10 111	1 920	1 062	2 363	2 811	18 929
1999	1 086	9 541	1 574	605	1 510	1 725	16 042
2000	204	11 364	1 206	490	1 609	1 181	16 055
2001	408	12 539	1 504	773	2 389	1 164	18 777
2002	300	8 064	540	380	962	553	10 799
TOTAL	17 118	190 782	16 994	19 187	47 256	26 080	317 417

[1] Numbers were calculated by adding all statuses (operating, permitted, abandoned, discontinued, and suspended) for all types of pipelines as of December 31 of each year.

5.2 Pipeline Failures/Hits

A pipeline failure is defined as the failure of the pipeline to contain the substance being transported. For statistical purposes, pipeline hits are included in the pipeline failure numbers.

- A hit is defined as striking a buried pipeline during a ground disturbance activity resulting in the pipeline or pipeline coating being damaged. A release of product does not necessarily result.

- A leak is defined as an opening, crack, or hole in a pipeline causing some product to be released, but not immediately impairing the operation of the pipeline.

- A rupture is defined as the instantaneous tearing or fracturing of the pipeline material, immediately impairing the operation of the pipeline.

The EUB's release reporting and inspection priority system applies to all pipeline releases and is defined as follows:

- Priority 1 releases pose the threat of serious environmental and public impact and are inspected immediately. In most cases, EUB field staff immediately respond to the location; however, when that is not possible, all attempts are made to have another regulatory agency respond. In these cases, EUB staff will conduct an inspection as soon as they can and will inspect 100 per cent of priority 1 releases.

- Priority 2 releases are mid- to high-volume releases but may include low-volume releases if the licensee is new or has a poor inspection history. These sites are generally inspected within 10 working days.

- Priority 3 releases are low-volume releases but may include medium-volume releases if the licensee has a satisfactory inspection history. In these cases, EUB staff have a high degree of confidence that the release will be appropriately handled. Historically, about 25 per cent of priority 3 spills are inspected to ensure they are satisfactorily addressed.

If a pipeline failure/hit occurs, the licensee or operating company is required to inform the local EUB Field Centre. EUB field staff record the information into a database, including date of occurrence, geographic location, pipeline specifications, operating conditions, environmental release information, cause, and priority rating of the release. The EUB's goal is to significantly reduce pipeline failures.

There were 34 ruptures in 2002, compared to 32 ruptures in 2001/2002.

Figure 22 indicates that the number of priority 1 releases has remained low. Leak detection systems, training and awareness programs, automated shut-in equipment, and pipeline patrols are effective in reducing these releases.

Table 8 shows the various causes of failures and corresponding inspections during 2002.

The following is a summary of the pipeline releases/hits from January 1 to December 31, 2002:

Ruptures	4%	Priority 1 releases	2%
Leaks	91%	Priority 2 releases	18%
Hits, no release	5%	Priority 3 releases	75%
	100%	No release	5%
			100%

Figure 22

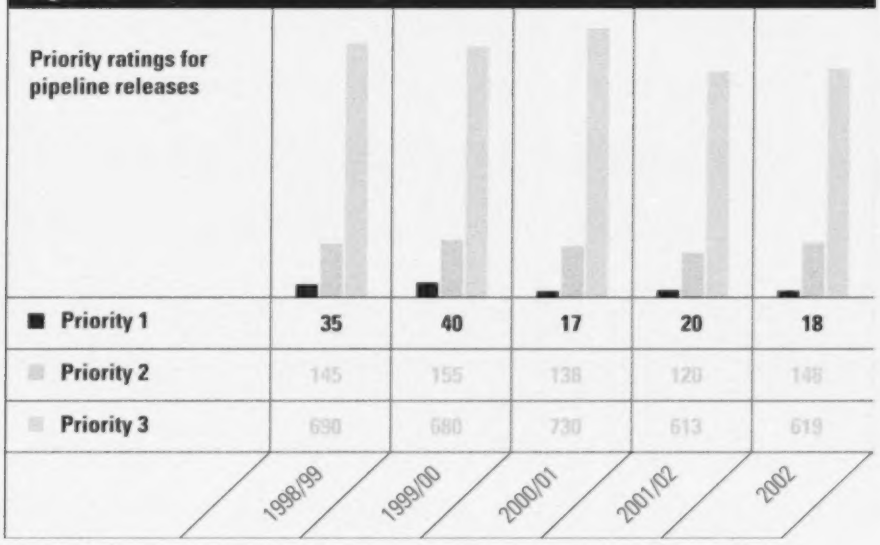


Table 8. Failures/hits reported from January 1 to December 31, 2002[1]

	Incidents		Leaks		Ruptures	
Cause	#	%	#	Inspections	#	Inspections
Internal corrosion	447	54	447	267	0	0
External corrosion	116	14	115	81	1	1
Joint failure	12	2	12	5	0	0
Mechanical joint	42	5	42	20	0	0
Girth weld	6	0.7	6	5	0	0
Construction damage	28	3	27	22	1	1
Damage by others (hits with release)	27	3	11	8	16	12
Damage by others (hits, no release)	39	5	0	32	0	0
Earth movement	13	1.5	13	8	0	0
Mechanical damage	4	0.5	4	2	0	0
Fittings/valve failure	9	1	9	3	0	0
Installation failure	2	0.2	2	2	0	0
Weld failure	3	0.3	3	1		
Seam failure	13	2	6	4	7	6
Pipe body failure	23	3	22	15	1	0
Overpressure	16	2	9	3	7	5
Licensee error	7	0.8	7	4	0	0
Miscellaneous	8	1	7	6	1	1
Unknown	9	1	9	2	0	0
TOTAL	824	100	751	490	34	26
% OF INCIDENTS		100	91		4.0	

[1] Statistics include 70 requalification test failures.

All failure incidents are reviewed with the licensee when the EUB Field Centre is notified about them. EUB field staff require the licensee to perform a failure analysis when there has been no previous investigation of the cause of failure (corrosion mechanism unknown). The licensee must also prove integrity and mitigate further occurrences.

EUB field staff conducted 516 inspections in 2002, focused primarily on corrosion-related failures, compared to 523 inspections last year. Staff investigate 100 per cent of corrosion failures. Not all corrosion failures are physically inspected; however, they are followed up through an investigation into the incident. In 2002, there were 456 satisfactory inspection, 14 minor unsatisfactory inspections, 46 major unsatisfactory inspections, and no serious unsatisfactory inspections. All unsatisfactory items were brought into compliance. In 2001/2002 there were 23 major unsatisfactory inspections and one serious unsatisfactory inspection. This increase in major unsatisfactory inspections can be attributed to the implementation of *Guide 66: Pipeline Inspection Manual*, which outlines the EUB's enforcement policy.

As a result of the failure inspections, licensees were required to do one or more of the following:

- undergo requalification pressure testing (of the 466 pipelines tested, 70 failed during the requalification pressure test)
- submit failure mechanism reports (411 were required to identify mechanism of failure)
- amend licences (there were 205 amendments to replace or internally line the pipe with a new corrosion barrier or to abandon the line)
- other requirements
  - determine product flow velocities
  - conduct analysis of product shipped and received (sampling)
  - modify system to enable corrosion rate monitoring
  - install corrosion control devices (inhibitor injection probes, sacrificial anodes, impress current anodes)
  - conduct internal electromagnetic or ultrasonic inspections
  - conduct cathodic protection surveys
  - install pigging facilities
  - conduct risk assessments

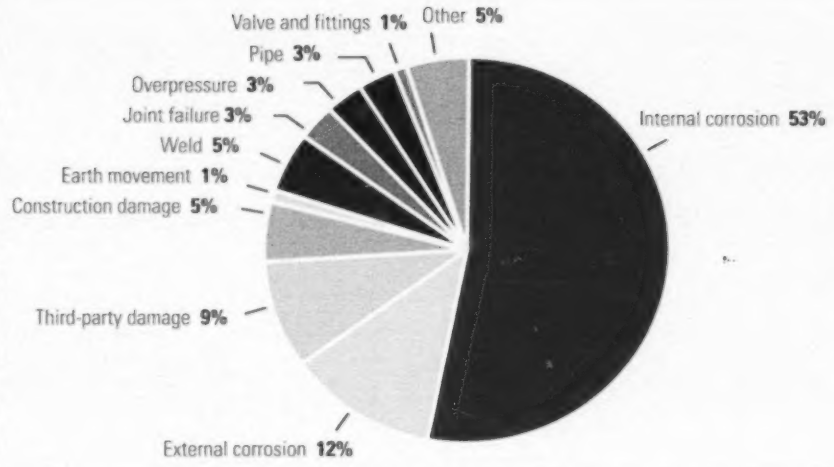
Figures 23, 24, and 25 are overviews of historical data compared to the most recent year reported.

Figure 23 indicates that the distribution of all failure causes has remained relatively constant. Corrosion continues to be the main cause of pipeline failures. Internal corrosion has increased from 425 failures in 2001/2002 to 447 in 2002. This increase is mainly attributed to pipelines that failed as result of requalification pressure tests. In addition, external corrosion increased from 78 failures in 2001/2002 to 116 failures in 2002. This increase is mainly attributed to the Swan Hills and Judy Creek Fields, where the pipeline systems had external coating problems due to increased product temperatures that the pipelines experienced.

Figure 23

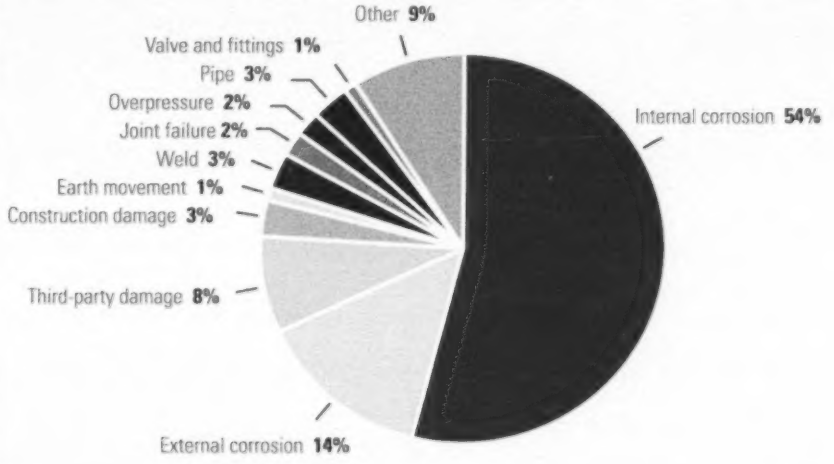
Historical pipeline failures by cause (%)

1980 - March 31, 2002



Pipeline failures by cause (%)

January 1 - December 31, 2002



EUB Action

- The EUB has met with licensees in the Swan Hills and Judy Creek Fields and received action plans for addressing the failures. We will monitor the effectiveness of these action plans in 2003.

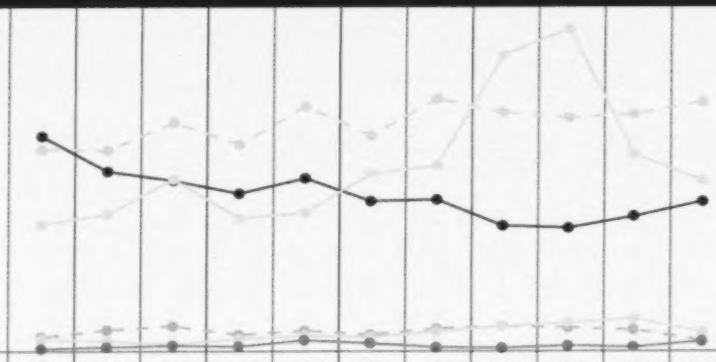
The EUB investigation of corrosion incidents requires failure analysis to determine the cause. Licensees must implement recommendations from these assessments to mitigate future occurrences of pipeline corrosion.

Although there was an increase in corrosion related failures in 2002, the number of failure incidents compared to total pipeline length in Alberta was reduced when compared to previous years (Figure 26). The implementation of *Guide 66* has clarified EUB expectations for identifying and addressing corrosion problems. In addition, *Guide 66* outlines the EUB's enforcement policy related to pipeline corrosion deficiencies.

Figure 24 indicates that natural gas pipeline failures have continued to decrease compared to previous years. This is due primarily to the efforts to reduce natural gas pipeline failures in southeastern Alberta.

Figure 24

Historical pipeline incidents by product being transported



	1992	1993	1994	1995	1996	1997	1998	1999	2000/01	2001/02	2002
Water	279	233	221	204	224	194	196	162	159	174	193
Multiphase	262	261	297	268	318	280	329	310	303	308	323
Crude	17	26	31	20	25	20	28	31	29	26	14
Sour gas	14	12	9	15	19	17	24	31	35	41	23
Natural gas	164	177	223	172	179	230	241	385	420	255	222
All other	2	4	6	5	13	9	4	3	6	4	10

EUB Action

- The decrease in the number of low-pressure natural gas pipeline failures in southeastern Alberta was due, in part, to successful efforts of industry to address the issue.

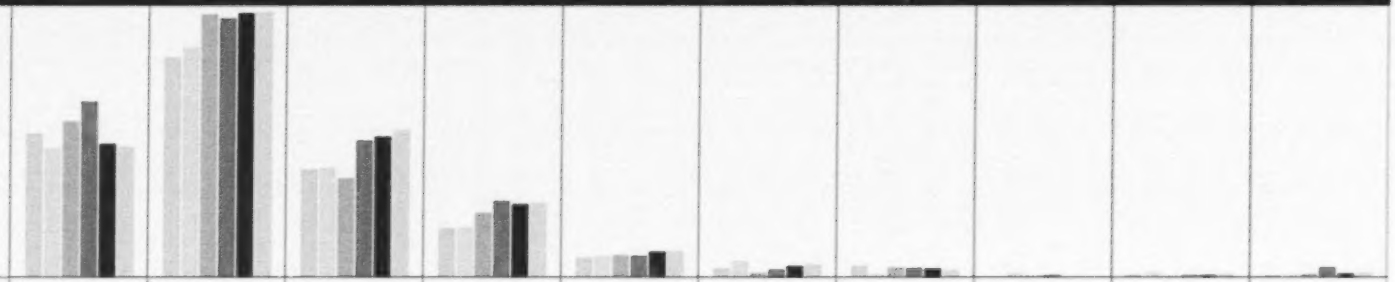
Figure 25 indicates that the majority of failures are occurring in smaller-diameter gathering lines, primarily the 60.3 mm (2 inch) to 114.3 mm (4 inch) systems.

A number of organizations contribute considerable resources towards pipeline integrity, maintenance, operations, and safety. These include

- Alberta One-Call
- Canadian Association of Petroleum Producers (CAPP)
- Canadian Centre for Materials and Energy Technology (CANMET)
- Canadian Energy Pipeline Association (CEPA)
- Canadian Standards Association (CSA)
- Edmonton Area Pipeline and Utilities Operators' Committee (EAPUOC)
- National Association of Corrosion Engineers (NACE)

Figure 25

Number of failures by pipeline size

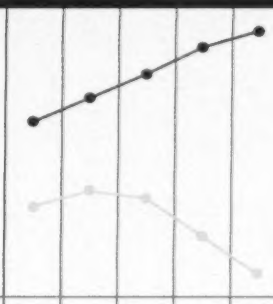


	60.3 mm (2")	88.9 mm (3")	114.3 mm (4")	168.3 mm (6")	219.1 mm (8")	273.1 mm (10")	323.9 mm (12")	355.6 mm (14")	406.4 mm (16")	>406.4 mm (>16")
1997	176	270	132	69	24	11	14	0	3	2
1998	158	282	134	61	26	20	4	5	5	3
1999	191	323	121	79	27	5	12	1	1	4
2000/2001	215	318	167	93	26	9	11	2	2	12
2001/2002	**163**	**324**	**172**	**89**	**31**	**13**	**10**	**0**	**2**	**4**
2002	160	326	180	51	32	16	8	0	4	6

Figure 26 shows that in 2002 the frequency of failure was about 2.5/1000 km, a substantial improvement over the 1998 benchmark of 5 failures/1000 km.

Figure 26

Failure incidents compared to total pipeline length



	1998	1999	2000	2001	2002
Length of pipeline (1000s of km)	256	272	288	306	317
Ratio (failures/1000 km)	3.2	3.4	3.3	2.8	2.5

Regional, national, and international pipeline conferences and workshops are held to share technology and information, which is contributing to a reduction in the pipeline failure frequency rate.

5.3 Construction and Testing Inspections

EUB field staff conducted 330 pipeline construction/test inspections in 2002, of which 283 were satisfactory, 40 were minor unsatisfactory, and 7 were major unsatisfactory inspections. There were no serious unsatisfactory inspections. All unsatisfactory inspection items were brought into compliance. This compares to 497 pipeline construction/test inspections conducted last year, when there were 443 satisfactory inspections, 38 minor unsatisfactory inspections, 16 major unsatisfactory inspections, and no serious unsatisfactory inspections. Examples of the unsatisfactory items found include the following:

- Minor unsatisfactory inspection items
  - Pipeline applications did not reflect proper information (pipe size, wall thickness, grade of pipe, and correct routing to and from locations). Note that in all cases the materials actually used exceeded requirements. Amendments were required to correct the pipeline applications.

- Major unsatisfactory inspection items
  - Wall thickness of pipeline at road crossings was improper.
  - Pipeline girth welds were not 100 per cent radiographed for sour service.
  - An existing pipeline was hit during construction and the licensee failed to report the incident to the EUB.
  - Pipeline was marked in the wrong location; hand excavation should have been done to verify the correct location.
  - Foreign pipelines were not marked and work progressed in a controlled area.
  - Machinery was working within 60 cm of pipeline without supervision.

5.4 Operations Inspections

In 2002, EUB field staff conducted 186 operations inspections. These inspections involve a field inspection of the pipeline system and a records review of maintenance documentation. The results were 65 satisfactory inspections, 85 minor unsatisfactory inspections, and 36 major unsatisfactory inspections. There were no serious unsatisfactory inspections during 2002. All unsatisfactory inspection items were brought into compliance. This compares to 234 inspections conducted last year, of which there were 120 satisfactory inspections, 92 minor unsatisfactory inspections, 22 major unsatisfactory inspections, and no serious unsatisfactory inspections. Examples of the unsatisfactory items found include the following:

- Minor unsatisfactory inspection items
  - Signage was missing, defaced, or had incorrect licensee contact phone numbers.
  - Record updates to indicate proper operating status of pipeline were incomplete.
  - Documentation of right-of-way patrols was not complete.

- Major unsatisfactory inspection items
  - Emergency procedures manual information was incorrect.
  - Valves/fittings or flanges were not properly rated for pressure of system.
  - Cathodic protection surveys were not performed.
  - No cathodic protection.

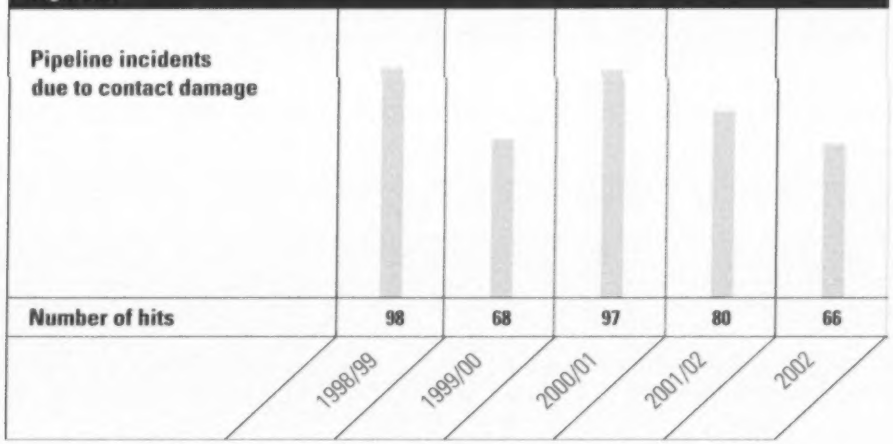
EUB Action

- The EUB will continue conducting detailed operations inspections that check a variety of items. Through these inspections, licensees that have failed to submit licence transfers and amendments will be identified and brought into compliance.

5.5 Contact Damage

The goal of this inspection area is prevention of pipeline damage (hits). If a licensee does not follow proper ground disturbance regulations, the EUB will apply enforcement, as detailed in *IL 99-4: EUB Enforcement Process*. There were 66 contact damage incidents recorded in 2002 (see Figure 27). Of these, 3 incidents were found to have minor noncompliance items, 17 incidents were found to have major noncompliance items, and there were no serious unsatisfactory inspections. All noncompliance issues were addressed. The remaining 46 incidents did not warrant enforcement action following an EUB review. This compares to 80 incidents the previous year, of which 25 incidents had major noncompliance items and one had serious noncompliance items.

Figure 27



EUB field staff conducted 19 ground disturbance seminars for licensees that were found in noncompliance. A further 23 seminars were held for educational purposes, with about 1000 people from industry and the public attending.

EUB Action

- The EUB is proposing revisions to the Pipeline Regulations to reduce pipeline contact damage. Stakeholder review of the proposed regulation changes will occur in 2003.

5.6 Public Complaints Associated with Pipeline Operations

There were 77 complaints associated with pipeline operations. The majority of complaints were a result of odours and spills from pipeline failures or venting of gas at pigging facilities and pipeline terminals.

6 Environment

6.1 Introduction

As mentioned earlier, for 2002 and future years the *Provincial Summary* will report on activities from January 1 to December 31. As a result, incidents reported in the last three months of the previous EUB *Provincial Summary* have been included in this report.

One of the EUB's primary responsibilities is the protection of the environment. EUB field staff have developed both internal and collaborative processes with other government agencies to minimize the environmental impacts from industry operations. EUB field staff inspect spills, drilling waste disposal operations, and waste management facilities, in addition to rigs, pipelines and production facilities.

Field Surveillance has two mobile air monitoring units that support our inspection activities at facilities where fugitive emissions are suspected.

6.2 Spills and Releases

6.2.1 Spill and Release Statistics and Inspections

A key goal of the EUB is to minimize the effects of spills regardless of where they occur. To ensure the most efficient and effective response, Alberta Environment (AENV) and the EUB developed *IL 98-1: A Memorandum of Understanding between Alberta Environmental Protection and the Alberta Energy and Utilities Board Regarding Coordination of Release Notification Requirements and Subsequent Regulatory Response*.

In addition to reducing the number of spills and releases, minimizing their effects is also important. To accomplish this, licensees must ensure that

- staff are provided with appropriate training,
- the source of the spill is stopped,
- the spill is contained,
- the free fluids are recovered, and
- the spill site is remediated in accordance with AENV guidelines.

Releases are prioritized by the EUB to allow for an appropriate, timely, and effective response:

- Priority 1 releases pose the threat of serious environmental and public impact and are inspected immediately. In most cases, EUB field staff immediately respond to the location; however, when that is not possible, all attempts are made to have another regulatory agency respond. In these cases, EUB staff will conduct an inspection as soon as possible and will inspect 100 per cent of priority 1 releases.
- Priority 2 releases are mid- to high-volume but may include low-volume releases if the licensee is new or has a poor inspection history. These sites are generally inspected within 10 working days.
- Priority 3 releases are low-volume but may include medium-volume releases if the licensee has a satisfactory inspection history. In these cases, EUB staff have a high degree of confidence that the release will be appropriately handled. Historically, about 25 per cent of priority 3 spills are inspected to ensure that they are satisfactorily addressed. In 2002, 19.3 per cent of priority 3 spills were inspected.

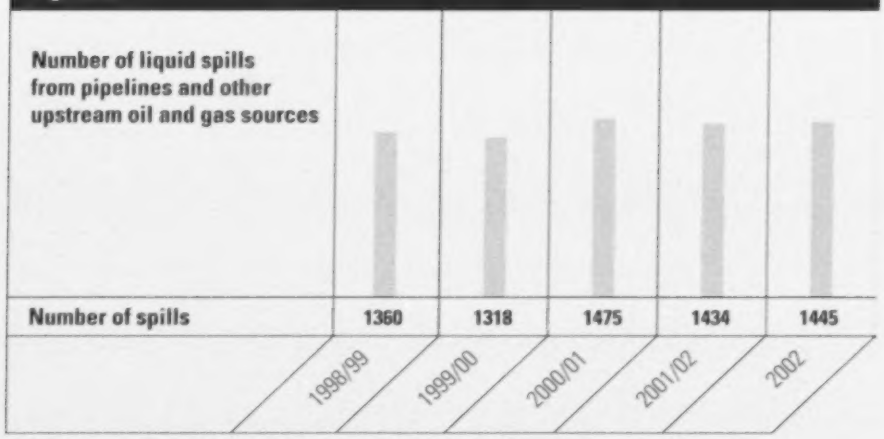
A comparison of the number of liquid spills since 1998/1999 is provided in Figure 28. As shown, a total of 1445 releases were reported to the EUB's eight Field Centres in 2002, a slight increase from 1434 in 2001/2002. Of the 1445 liquid spills,

- 26 were priority 1 (1.8 per cent),
- 308 were priority 2 (21.3 per cent), and
- 1111 were priority 3 (76.9 per cent).

It is important to note that more than three-quarters of all spills were low volume and usually contained on lease. Inspections were conducted on 631 spills. There were 594 satisfactory spill inspections, 23 minor unsatisfactory spill inspections, 14 major unsatisfactory spill inspections, and no serious unsatisfactory spill inspections (see Section 1.3 for definitions of satisfactory inspection and minor, major, and serious unsatisfactory inspections).

The number of liquid releases increased slightly and could be reduced if industry improved maintenance and pipeline corrosion control programs. The EUB continues to work with industry towards those goals.

Figure 28



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- EUB *Guide 55: Storage Requirements for the Upstream Petroleum Industry* was revised and published in December 2001. Staff ensure compliance with *Guide 55*, which keeps spills confined to a smaller area and reduces the environmental impact. The EUB will continue to focus on industry's compliance with this guide in 2003.

6.2.2 Main Causes of Releases

Pipeline corrosion, equipment failure, and licensee errors were the leading causes of liquid releases in 2002. Figure 29 shows the most significant sources and causes of releases and clearly indicates that industry must become more effective with its preventive maintenance and corrosion control programs.

Figure 29

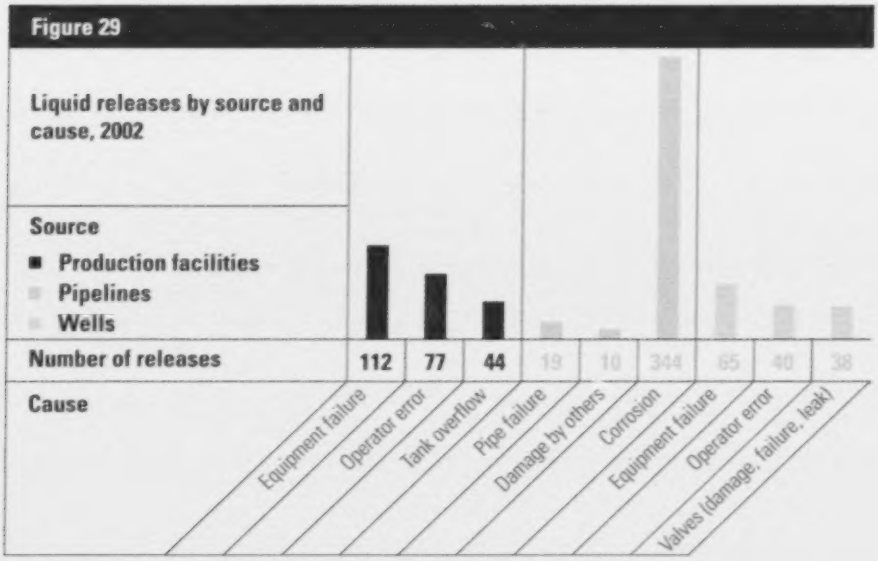
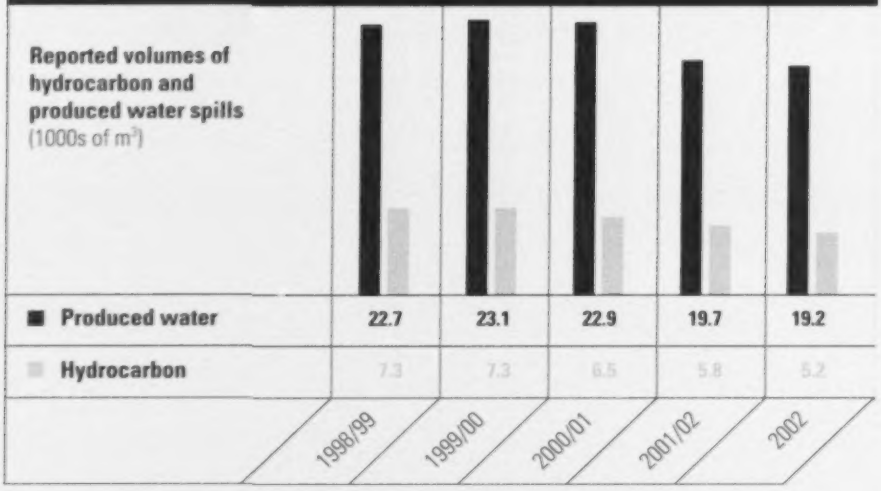


Figure 30 provides the volume of hydrocarbon and produced water spills over a five-year period. The spill volumes of hydrocarbon and produced water in 2002 were 5188.8 cubic metres (m^3) and 19 164.8 m^3 respectively. This is a reduction from the 2001/2002 release volumes of 5877.3 m^3 hydrocarbon and 19 748.0 m^3 produced water.

Figure 30

Reported volumes of hydrocarbon and produced water spills
(1000s of m^3)



6.2.3 Release Prevention

Spill response training exercises ensure that industry personnel are adequately trained to effectively respond to spills, thereby minimizing the impacts. There are 17 oil spill cooperatives throughout the province, 2 of which overlap into Saskatchewan and British Columbia.

In 2002, EUB field staff participated in all 17 oil spill cooperative training exercises and provided information on release statistics, release reporting requirements, and regulation change.

The EUB strongly supports the spill cooperatives and regularly participates with groups such as the Western Canadian Spill Services (WCSS) to enhance spill response preparedness throughout the province. Cooperative meetings and spill exercises provide EUB staff with the opportunity to communicate the importance of spill prevention.

EUB Action

- WCSS, Petroleum Industry Training Service (PITS), industry, and the EUB are working together to improve spill prevention programs. Spill response training will continue to improve industry response capabilities and reduce the environmental impacts from spills.

6.3 Mobile Ambient Air Quality Monitoring

6.3.1 Monitoring Equipment

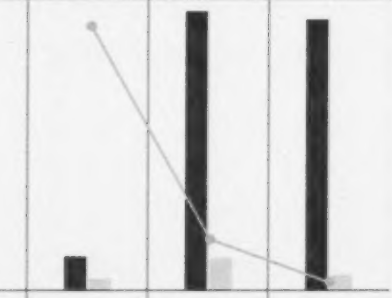
Field Surveillance has two ambient air monitoring units (AMUs) equipped with analyzers capable of reading and recording hydrogen sulphide (H_2S) and sulphur dioxide (SO_2) emissions. The EUB purchased the second air monitoring unit in response to the recommendation from the Public Safety and Sour Gas Advisory Committee.

6.3.2 Routine and Complaint Response Monitoring

Field Surveillance uses its two air monitoring units to assist inspection staff in identifying facilities that emit fugitive emissions. To accurately depict recent air monitoring results and industry's compliance record, Figure 31 is divided into six-month segments. As can be seen, industry is improving its compliance record with respect to reducing emissions from oil and gas facilities. The most common sources of emissions were leaking tank hatches and ineffective vapour gathering systems on storage tanks.

Figure 31

Number of facilities monitored and improvement in reduction of emissions



	2001	January - June 2002	July - December 2002
■ Number of inspections	28	234	227
Unsatisfactory inspections	10	27	13
Percentage unsatisfactory	36	11	6

In addition to conducting routine monitoring and responding to complaints, the mobile monitoring units are available to respond to emergencies. In 2002, the air monitoring units responded to three emergency situations.

6.4 Waste Management Initiatives

6.4.1 Waste Management Facilities

There are 69 operating oilfield waste management facilities approved by the EUB. Waste management facilities, as described in *Guide 58: Oilfield Waste Management Requirements for the Upstream Petroleum Industry*, include

- waste storage facilities,
- waste transfer stations,
- waste processing facilities,
- surface facilities associated with waste disposal wells,
- waste disposal wells (classes 1a and 1b),
- caverns,
- landfills,
- biodegradation facilities, and
- thermal treatment facilities.

In 2002, field staff conducted 65 waste management inspections, resulting in 35 satisfactory inspections, 24 minor unsatisfactory inspections, 6 major unsatisfactory inspections, and no serious unsatisfactory inspections. Off-lease odours, failure to meet *Guide 55* storage requirements, and staining/spillage were the most common deficiencies identified. All facilities were brought into compliance. This compares to 54 waste management inspections conducted in 2001/2002, which resulted in 27 satisfactory inspections, 23 minor unsatisfactory inspections, 4 major unsatisfactory inspections, and no serious unsatisfactory inspections.

The EUB Operations Section conducted 15 audits, which identified minor deficiencies at 8 facilities. All unsatisfactory facilities were brought into compliance. This compares to 6 audits conducted in 2001/2002, which resulted in minor deficiencies at all 6 facilities.

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- EUB field staff will continue to meet with facility licensees to improve their understanding of EUB requirements. In addition, the EUB will meet with the Alberta Oilfield Treating and Disposal Association to increase their members' understanding of the requirements and improve their compliance record.

6.4.2 Drilling Waste Management

EUB *Guide 50: Drilling Waste Management* is the key document regulating drilling waste disposal. Two government agencies are responsible for regulating drilling waste management in Alberta:

- EUB, for private land, and

- Sustainable Resource Development for public land (white and green areas).

Drilling waste disposal methods are identified in *Guide 50* as being either routine or nonroutine:

- routine—any disposal described in *Guide 50* that does **not** require preapproval (e.g., mix-bury-cover, landspray, landspray while drilling, and pump-off)

- nonroutine—any disposal described in *Guide 50* that requires preapproval (e.g., land treatment, biodegradation treatments, and alternative disposals)

In February 2002, EUB *Guide 70: Drilling Waste Disposal Inspection Manual* was released to ensure that EUB drilling waste disposal inspections are carried out in a consistent manner. The guide is also intended to inform industry of EUB expectations and requirements.

In 2002, 67 nonroutine drilling waste sites were inspected. Of those, 60 had satisfactory inspections, 6 had minor unsatisfactory inspections, and one had a major unsatisfactory inspection. There were no serious unsatisfactory inspections. All of the unsatisfactory inspection items were brought into compliance. This compares to 2001/2002, when 86 nonroutine drilling waste sites were inspected and 65 had satisfactory inspections, 20 had minor unsatisfactory inspections, and one had a major unsatisfactory inspection.

In 2002, 110 routine drilling waste disposal inspections were conducted. Of those, 75 had satisfactory inspections, 17 had minor unsatisfactory inspections, and 18 had major unsatisfactory inspections. There were no serious unsatisfactory inspections. This compares to 2001/2002, when 179 routine drilling waste sites were inspected and 125 had satisfactory inspections, 40 had minor unsatisfactory inspections, and 14 had a major unsatisfactory inspection.

EUB Action

- *Guide 50: Drilling Waste Management* is currently under review; the new edition is scheduled for completion in 2004.